THE HUMAN NATURE CLUB

The Human Nature Club

An Introduction to the Study of Mental Life

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PREFACE

This book aims to introduce the reader to the scientific study of human nature and intelligence. It is intended to be useful to intelligent people in general and especially to young students in normal and high schools beginning the study of psychology. The author has tried to write so simply that previous knowledge of science, explanation by a teacher, and even unpleasant effort on the part of the reader, will be unnecessary. At the same time he has tried to be true to fact and sound in method.

One must not expect too much of a book which tries to handle psychological questions without resort to technical words and without presupposing knowledge of elementary science. If the book tells a little truth and does not deceive readers into thinking that it tells more than a little, it may serve a good purpose in waking people up to the possibility of a scientific study of human nature, and introducing them to some of the published results of such study.

For the unconventional form and for the adoption of a thoroughly fictitious dialogue, no excuse is offered. The fiction is frankly announced and should certainly not prevent the reader from realizing that all the pretended discoveries of the members

of the Human Nature Club are really the results of long labors by trained thinkers.

It goes without saying that the author is indebted to psychological literature in general so far as he is acquainted with it. In particular he is indebted to the writings and teachings of Professor William James, who is so often paraphrased in this book. The debt to Professor James is so evident that it seems unnecessary to point out the many places where his formulæ have been made to do service.

Teachers College, Columbia University, New York,
December, 1900.

TABLE OF CONTENTS

THE HUMAN NATURE CLUB

CHAPTER I

WHAT THE BRAIN DOES

Mrs. Ralston stood at the door of her son's room and knocked. "Breakfast in five minutes, Arthur. I thought you got up when I called before." "All right; I'll be down," came from within, and Mrs. Ralston went downstairs. There she found the rest of the family assembled in the sitting-room. "Arthur will be down in a few minutes; we'll wait for him," she said; and then turning to Mr. Tasker, who was half boarder, half friend of the family, "How did you like the lecture last night?"

"It was fine," was the reply. "Solid and worth while, and still very entertaining. His general theme was the interesting things one can find in the world all about him if he'll only look. You remember how we puzzled over his title, 'They Have Eyes'? He claimed, for instance, that we could see how the rivers and valleys and plains and lakes have been formed if we'd only watch Bear Brook."

"Yes!" broke in Mrs. Elkin, Mrs. Ralston's married daughter; "but don't you think that it depends on who looks? The geologist sees all those things in Bear Brook because he knows geology, just as a cook could tell just how hot the oven was by looking at

a loaf of cake, while you, though you are a schoolmaster, couldn't see anything but dough and crust."

"I know that's so in some things," said her husband; "for don't you remember how the man who had the high school before Tasker would see all sorts of bugs and worms when he was walking along the road, things you couldn't see till he almost put his finger on them? It isn't the eyes that see; it's the knowledge behind them. It wasn't his eyes; it was his course at the state agricultural college. I thought last night at the lecture that if it weren't so, I wouldn't have any excuse for knowing almost nothing of the world outside the boot and shoe business and the art of beguiling brook-trout. You have to study a long while before you can see things. If there were any science that didn't need systematic school training, I'd study it."

"I wish we could study the real world somehow," replied Tasker. "We've had a Browning class and a Greek art class and a Church History class, and I wouldn't wonder if it would do us good to stop studying books and study real things for a while.

"Let's study breakfast," said Mrs. Ralston. "I wonder what's the matter with Arthur?"

"I'll run up and bring him down," said Mr. Elkin. "The rest of you go ahead."

He went up and entered Arthur's room without knocking.

There sat Arthur, all dressed except one shoe, which he held in his right hand. His left hand was scratching his head, and his face wore a meditative expression.

"What's the matter, Arthur? Breakfast's all ready."

"I know that, Elkin. Say! Can you tell me how many stairs you just came up?"

"What in the world do you want to know that for? Come on down to breakfast."

"I won't go down those stairs till I either know how many stairs there are or know why I don't know. I don't believe you know yourself."

"There are—there are—well, I guess I don't. Odd, too; I've been up and down them hundreds of times."

Arthur began to laugh at his brother-in-law, and the latter to cover his confusion went out and called to those below: "Come up here, everybody. Arthur's gone daft. He's sitting here raving about stairs."

"Yes! Come up here," cried Arthur; "we'll see who's the fool. Stand up in a row there," he added as they came into the room. "How many stairs did you just come up, mother? Well, well! And you've been up those stairs thousands of times. Next! Next! Eyes to see! This is an observant family."

"What's got into you, Arthur?" said his sister. "It is queer that we should all know so little about a thing we've done so often; but what started you thinking such stuff?"

"You know that lecture last night? Well, when I got out of the bath-tub I thought I'd start in to observe things, and I wondered what I could observe, and then I wondered why I felt fresh from a cold bath, and I couldn't tell; and that set me thinking while I was dressing that lots of common things were

really rather mysterious, and then it struck me that I had dressed myself without thinking about it at all, and I wondered at that; and then I noticed that I had my right shoe on, and I wondered if I always put that one on first; and then I wondered about doing things without thinking about them, and thought of the next thing I had to do—to go downstairs, that is—and I realized that I generally did that without thinking how to do it at the time, and then it struck me that I really couldn't think how to do it, that I didn't even know whether there were a dozen steps or twenty. And then I wondered how I could have gone up and down those stairs and never noticed that. I suppose you folks are hungry and think I'm silly."

"Yes! I know why I want to eat," remarked Mr. Elkin.

They ate their meal in a queer way. Mr. Tasker sat with his brows furrowed, whispering occasionally to himself. Arthur would occasionally stop eating to stare at some one or apparently to question himself. At last he blurted out, "Why do you suppose Emma likes boiled eggs, while I, her brother, abominate them?"

Everybody laughed except Mr. Tasker. He pulled out his watch, and said: "Will you all please listen to me a few minutes? I have a scheme. If you'll keep still for five minutes, I'll tell you about it. I must go down to the school at a quarter-past eight, and you can make fun of it after I've gone. You know before the excitement of Arthur's discovery we were saying that it would be a fine thing if we could study some things in the real world for ourselves, instead

of just soaking in book knowledge, if we could get the sort of pleasure (and profit too) that the lecturer last night told us came from looking to see how things really are. Now, no one of us has enough knowledge to start in studying bugs or plants or brooks, and not all of us have enough of an interest in any one of these things to induce us to do the studying. But I believe there's one thing that we're all interested in, that's well worth looking at, but that doesn't require us to read German books or buy microscopes or make big collections. Arthur has opened his eyes to it this morning, and I got my idea from him. Let's look and see how real people live and act and think. Let's get our eyes open to human nature, to the real world, not of mountains, or brooks, or birds, or beetles, but of people. Let's have a club, 'The Human Nature Club,' whose business it shall be to see how and why we and our friends do the things we do, think the thoughts we think. Let's start in by finding out how we can dress ourselves without thinking about it, and how we can go up and down a flight of stairs from one to twenty years without learning how many stairs there are. Think it over; I must go. Good morning all!"

"Wait a minute; I'll go with you," said Arthur. They left the house together, Mr. Tasker going to the high school and Arthur to his duties as assistant manager of the Redpath Tool Company.

Mr. Tasker did not return to the house till nearly eight o'clock that evening. When he came into the sitting-room he was surprised to see besides the regular household, Miss Fairbanks, a music-teacher who

lived in the neighborhood, Miss Atwell and Miss Clark, two teachers in the graded school, and Mr. Henshaw, the manager, editor, chief reporter—in fact, the general producer of the *Westfield Register*.

"Who is having a surprise party?" he exclaimed.

"This is the Human Nature Club," replied Mrs. Elkin. "I spent most of the morning talking about it, and all of the afternoon hunting these folks and telling them about it. We've just elected you boss, or rather president, and we're ready to start ahead."

"We've progressed this far," added the editor. "Everybody here knows that the scheme is to watch real people, especially ourselves, to see what they are, how they learn things, why they think and feel and act as they do. Everybody is to keep his eyes open for facts about people. We had just begun to air our wisdom in connection with that mystery of the stairs. Now, how shall we run this organization, Mr. President?"

"I suggest," responded Mr. Tasker, "that we leave rules and regulations till we have investigated the 'mystery of the stairs,' as you call it. What did you decide, Arthur? You are the father of this, our first problem."

"I don't know that I have decided. I've been thinking of a number of things like it, things which I can *get along with* first-rate, but which I don't seem to know much about. I didn't know whether there were four or five or six buttons on my vest; I don't know how many hooks there are in my closet, though I've used that closet for eight years."

"It's the same sort of thing, isn't it, when I go

along the hall in the dark and stop just in front of my bedroom door? I couldn't for the life of me tell how many steps I take, but I always stop in the right place."

"That's like my playing the piano," said Miss Fairbanks; "I see the notes and put my fingers on the keys, but I don't once think, 'That is G,' or 'That is a half-note higher,' or 'Now I will stretch my little finger way out.' Of course I could if I stopped to think about it, but I don't, any more than you think of the number of stairs or the number of steps. I'm sure we all do do things that way without thinking about them, and we can agree for a start that one can do things without at the time or afterward knowing much about it."

"That is so," said Mr. Tasker; "but it makes two new questions out of our old one. In the first place, how do we come to do things without having to think about what we're doing? In the second place, how do we know so little afterward about what we've done so many times?"

"I think that perhaps I can answer the first question," said Miss Atwell. "When I was visiting Kate Maxwell, at Barnard College, I went to some classes with her, and at one of them the professor was lecturing about the brain. He said that the brain was a machine for connecting our bodily acts or movements with what we heard and saw and felt. For instance, the reason why when you see a team coming, you get out of the way, is that some sort of commotion in your eyes is transmitted along a nerve to your brain and stirs up some commotion there, which is transmitted through other nerves to your muscles and

somehow makes them move your body in such a fashion that you run across the street out of the way. As far as I could make out, the brain was like the big switchboard in the telephone office. Messages coming in from all over the body get connected with the proper wires, so to speak, and sent out to the right muscles. Now, if I'm right, all you have to suppose to answer our question is that the commotion or message can be sent to the right muscles without your thinking about it—without the operator at the switchboard having to bother about it, to stick to my illustration. Thus just seeing the top of the stairs and feeling each one as you step rouses just the right movements. When you were first learning to play the piano you would make mistakes and have to think about what you were doing, but after enough practice the brain would do the work of itself. The commotion aroused in the brain by seeing the notes of a certain chord would go in a certain way—that is, to the right muscles—because it had gone that way so many times. It would be like water that having worn a certain channel always runs in it. Excuse me for talking so long, but I think we can see a reason for our being able to do things unconsciously if we think how the brain acts."

"That sounds all right, with one exception," answered Mr. Tasker. "You say, if I understand you, that anything which we have done in certain circumstances tends to be done again if the same circumstances occur again. But that isn't so if the results of the act are painful. Little Helen, the first time she saw a candle—when she was about a year and

a half old—put out her hand to take it and was burned. According to your theory she would the next time she saw a candle, put out her hand. But as a matter of fact she didn't. She shrank back without reaching. What you say is true of cases where the results are pleasurable or indifferent, and

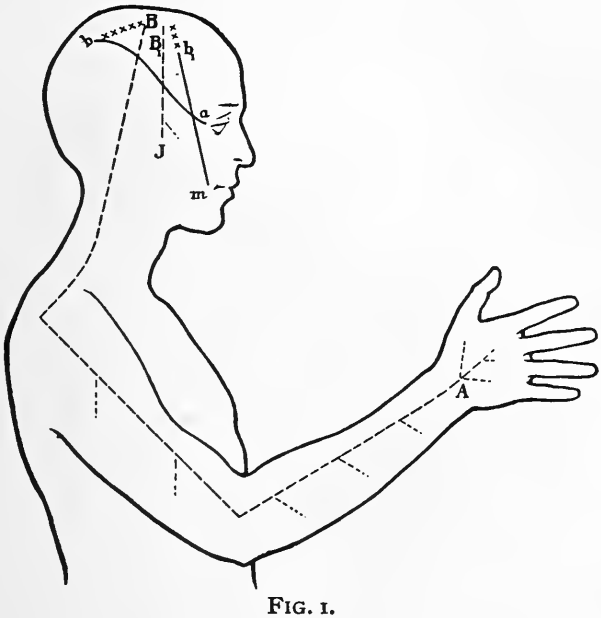


FIG. 1.

explains our cases, but it needn't always be true. Isn't that so?"

Miss Atwell nodded assent, and Mr. Tasker continued: "I wish you'd let me draw a picture to show my notion of what you said about the brain, and see if I understand you. Perhaps it will help us all."

Arthur brought in the baby's blackboard, and Mr. Tasker drew his picture (Figure 1), giving at the same time the following explanation:

"This picture is supposed to represent very roughly what happens in doing two things which we do automatically—that is, without thinking about how to do them. The two things are playing the piano and chewing gum. In playing the piano something happens in the eye which sends some sort of a current or commotion or explosion up to the brain, as I show by the line *a b*. This results in some sort of current or commotion being sent to the muscles which move the forearm and fingers, as I have shown by the dotted line *B A*. Just how the thing coming from the eye gets switched so that it starts the thing going to the arm I don't know, as I show that by the line of crosses *b B*, which means simply that somehow *a b* is connected with *B A* so that what the eye sees influences what the arm does. In chewing gum the presence of the gum in the mouth arouses the jaw muscles to act in the same way, a continuous line, $m\ b_1$, representing the mouth-brain connection, a dotted line, $B_1\ J$, the brain-jaw muscle connection, and a line of crosses the connection between the two. Does that represent the ideas of the company and agree with what the professor said, Miss Atwell?"

"Your explanation is worthy of our high school principal, but I'm glad you don't have to teach drawing," said Mr. Henshaw.

"Don't laugh at my drawing," was the reply; "for if that represents the idea, I'm going to try another to show my general idea of the brain as I've derived it from Miss Atwell's description. Here is the brain (Figure 2), with a lot of things—nerves, I suppose they are—coming in from all over the body and bring-

ing in the 'commotions' that correspond to the electric currents coming in to the telegraph office over the wires. The continuous lines represent those. The dotted lines are the nerves going out to all the muscles. The crosses are the connections made on

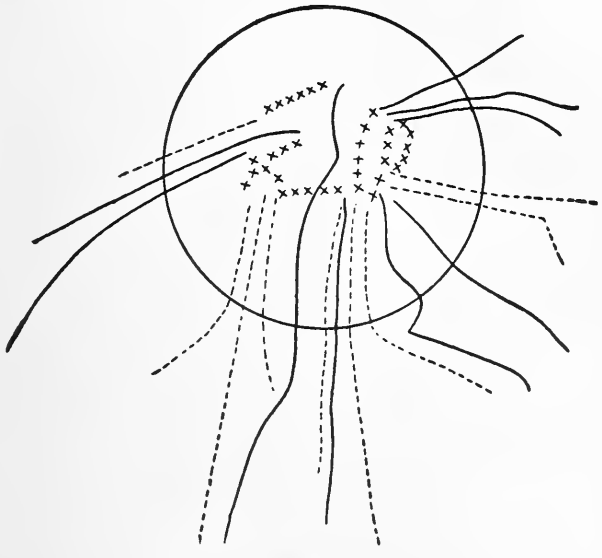


Fig. 2.

the switchboard. Multiply all these lines by thousands and you have the brain. Is that right?"

"It's right as far as it goes, but the brain is more than that, I'm sure, though I can't remember just what else the lecturer did say about it."

"Why wouldn't it be a good thing for me to run over to Dr. Leighton's house, and see if he can't tell us a bit about our brains. We can learn about the outside facts of human nature ourselves by watching ourselves and other folks, but we can't watch our brains; and he has had the chance to study them, so

why not profit by his experience? I think that we'll find that the brain plays a big part in making human nature what it is in other things besides these unconscious performances, habits, automatic acts or whatever you call them."

Mr. Henshaw's proposition was received with approval and he went after the doctor. The others spent the next ten minutes in talking over what had been said and in congratulating themselves on the success of their first meeting.

"This has been as hard thinking as I've done for a good while, apart from business," remarked Mr. Elkin; "yet I declare I've enjoyed every minute of it. It pays to think about things if you know anything about them to start with, and can work them out yourself, or make believe that you do."

"My head is full of about twenty questions to be investigated, which will be, if anything, more interesting than this one," added Arthur.

So they kept on until Mr. Henshaw came in with Dr. Leighton. After he had greeted the company, the doctor began:

"Mr. Henshaw tells me that you are observers of human nature, and have a notion at the start that what people do and feel depends largely on the way their brains work, and since you can't yourselves observe what goes on in people's brains you have asked me to tell you something about it.

"You are quite right in thinking that human thought and action, in other words, human nature, depend on what happens in the brain. For instance, Mr. Tasker here is a steady sort of person, but if

I should inject into his brain a little of a certain drug, he would become very volatile and changeable for the time being, would feel very wretched and then very exalted, etc. His nature would be changed *for the time being*. Let me cut out a little piece in one part of your brain and you'd never see things any more. Let me cut out a little piece in another place and you would lose your command of language. Let a person tire his brain by overworking or maltreating it and his nature grows irritable. You have all seen that in young children after an exciting, restless day. If a person's brain doesn't grow, he may really have no *human* nature at all, but be an idiot, almost like a mere beast.

"What, then, is this brain of ours, and how does it do its work? In order to be clear I shall have to simplify things somewhat, and I beg you not to imagine that in these ten minutes you will get an accurate or complete notion. I will try, however, not to give a false notion. The brain and the other parts of the nervous system are a very complicated apparatus for fitting our acts to our surroundings, for making us swallow food when it's in our throat, reach for things we want, take food when we're hungry, go to work when it's time, etc. The brain's business is to *be influenced* by what happens *to* us, what we see, hear, feel, etc., and *to influence* what happens *in* us—*i. e.*, what we do or say. It thus is the connecting link between what the world does to us and what we do to the world.

"Now, to see how the brain or nervous system does this, how it works, we must see how it is made. So

first look at this picture, a picture of one of the units or 'cells,' millions of which together make up the brain. You see that it looks like a string frayed out at both ends, and has a notable swelling in one place and little side strings running off from it and fraying out at their ends. The real thing which it represents may be very short or may be several feet long, but it is never anything like as big around as the picture shows it. A hundred of these nerve-cells, or brain units, or nerve-strings stuck together in a bundle would not be as big around as the smallest needle. Now, imagine nerve cells or strings like this with one end in the eye and the other end in the brain or spinal cord, which is really a part of the brain. Imagine other thousands starting from the ears and nose and tongue and fingers and stomach and joints—in fact, from different organs all over the body—and ending in the brain. Imagine, also, other thousands of such nerve-cells or strings with one end in the brain and the other end in connection with some muscle, or perhaps gland. Imagine, in the third place, thousands of such nerve-strings, entirely inside the brain—I always mean to include the spinal cord, too—running from one part of it to another. Imagine all

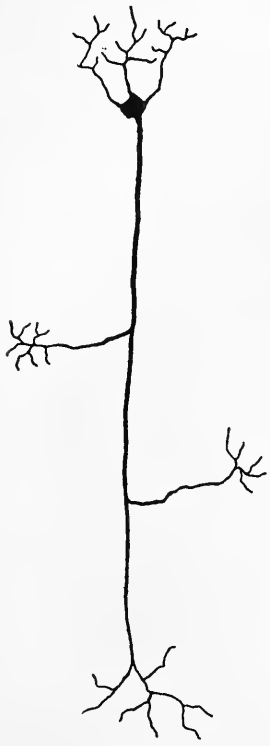


FIG. 3.

these strings to keep the same places. Then you will have a notion of what the brain and nervous system is. It is just the sum total of all these nerve-cells running from eyes, ears, skin, etc., to a central mass, where there are a lot of connecting strings, and running out from it to all the muscles. You were quite right in likening the brain to the switchboard of a telephone office; and just as a telephone system is really nothing but a lot of incoming and outgoing wires and a lot of connecting wires at some central station, so the nervous system, including the brain, is really only a lot of nerve-cells, incoming cells, outgoing cells and connecting or associative cells.

"That is what the brain is. Now, what the brain does is just what the particular nerve strings or cells do. When we say that anything is done by the brain, we mean just that it is done by one or ten or ten thousand of these nerve strings or cells. Just as a telegraph system acts only as the wires act, so the brain acts only as its cells act. How, then, do these cells act? What does a nerve-cell do? If we answer that question we shall know what the brain does.

"Now I shall tell you the important, the essential business of a nerve-cell. There may be other things which it does, but its one sure and chief business, or *function*, to use a scientific word, is to *transmit*, to so act that any commotion or action at one end of it will be carried along it to its other end. If you will call to mind some common cases of transmission, you will get a clear notion of what I mean. Drop a stone in a pond, and the wave around it causes another wave in a wider circle, that causes still another, and

so on till the last wave may be at the pond's edge. The water, we say, has transmitted the wave from the center to the edge of the pond. The action or commotion at the center has been carried across the water. Take a piece of clothesline ten or fifteen feet long; shake one end of it up and down; the 'wave' of motion passes along the string to the other end. Put one end of a poker in the fire, and the other end gets hot. The electric discharge of a lightning-flash striking one end of a lightning-rod is transmitted along it to the ground. The rod conducts it, we say.

"Now, we don't know just what sort of commotion it is that a nerve-cell, a nerve-string, conducts, or just how it transmits it; but we do know that it does do it, that its business is to conduct what we may call nerve-currents or nervous discharges set up at one end of it to its other end. Thus a commotion or nerve-current, set up or started in cells having their ends in the eye by the sight of a dollar bill on the sidewalk, is transmitted or conducted along them to their ends in the brain. Now, this commotion or discharge or current can pass from the frayed end of one cell to the frayed end of another cell close enough to it, just as the electric current can go from one wire to another if they are near enough. I'll show this in a rough picture (Figure 4). So the current started in the eye, having reached the brain, may go over to the ends of connecting cells, go along these, go over to other cells, go along them, and finally end up at certain muscles. It may there make the muscles move in certain ways so that we stoop to pick the dollar bill

up, just as an electric current may be transmitted from a battery through switch after switch until it finally ends in a charge of dynamite and blows a rock to pieces.

"Moreover, just as an electric current may blow up a rock, or light a lamp, or silver-plate a spoon, or connect your telephone with mine, or with Mr. Elkin's, or with that of some man in New York, according to what connections are made between the different wires, so the result of any nerve-current in a nerve-cell depends on what other cells that cell is connected with. One person's nerve-cells are so connected that the sight of a mouse makes her jump on a chair; another person's nerve-cells are so connected that the sight of a mouse makes him seize a cane and try to exterminate it. A cat's nerve-cells are so connected that the sight of a mouse makes her jump at it. When people act differently in the same circumstances, it generally means that their nerve-cells have different connections.

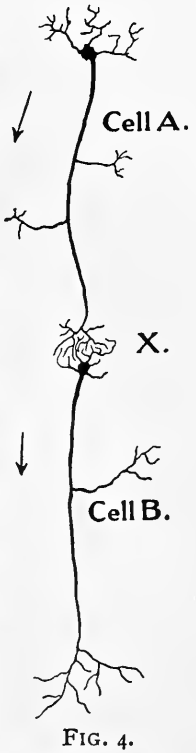


FIG. 4.
The current passes from one cell to the other via the frayed ends at x.

"I mustn't take any more of your time, and I have a patient to see this evening, anyway. Any time that I can help you again, be sure to let me know."

The doctor hastily left the room, in the midst of exclamations of thanks from the company.

"Dr. Leighton ought to have been a teacher,"

said Mr. Tasker. "That was a pretty good piece of description to be given extemporaneously."

"Well! These young doctors that the good medical schools are turning out know their business, I think," replied Mr. Elkin. "What were you scribbling all the time?"

"You'll be glad later that I did scribble. I've taken down every word in shorthand, and I'm going to have our typewriter make a copy. That talk of the doctor's will do us about ten times as much good if we read it over carefully and keep a copy to refer to. It seems all clear now, but by next week it will be foggy in my mind, I'm sure, if I don't have a chance to go over it. If any of you would like to do the same, I'll get more copies made."

"One for me, please," said Mr. Tasker; and all agreed to come to the next meeting with all the doctor's description clearly fixed in their minds.

"It's time for me to go," said Miss Atwell. "What question is proposed for next time?"

"I'd like to know why people who are very old think most about things that happened when they were very young," said Mrs. Elkin.

"And I'd like to know why you always break dishes when you are all tired out mentally."

"I'd like to know if there are any things that we can do not only without thinking about them, but also without even learning to do them at all," said Arthur.

"I'd like to find the explanation of some of the things the Christian Science people do," added the editor. "But let's leave it to Mr. Tasker."

"Well, I suggest that Arthur's point be taken up

first, at any rate, as it seems more closely connected with to-night's discoveries, and also that some one sum up the result of the Human Nature Club's findings so far. Is that agreed? Very well; I'll appoint Miss Atwell. The Human Nature Club is adjourned until next Saturday."

NOTES BY THE EDITOR.

The gist of this chapter is that the brain is a machine for making connections between what we feel and what we do, so that we can fit our acts to our surroundings. We can do things without thinking about them when such connections have been made. In technical terms, the brain is an associative mechanism, and can carry on automatic activities.

CHAPTER II

THINGS WE DO WITHOUT LEARNING

"The Human Nature Club will come to order.

"Let us have the report of the last meeting from Miss Atwell."

"Mr. Chairman, at its first meeting the club investigated the facts reported by Mr. Arthur Ralston, and found that they suggested two questions: First, how we could do things without thinking of what we were doing; and secondly, how we could do a thing a great many times and still know very little about it. The latter question we did not reach, as it seemed rather apart from the first, but the first we answered by saying that the brain could learn by practice to fit our actions to our surroundings in certain cases, and so finally get along without any assistance from our thoughts; the act, that is, becomes automatic. With the help of Dr. Leighton, we found the reason for the growth of such habits to be the structure of the brain, it being really not, as it looks, a big lump of jelly-like stuff, but a wonderfully complex system of connections between the parts of our body which sense or feel things and those parts which cause our actions."

"If there are no objections, this report is accepted."

"The particular object of this meeting is to report observations of actual facts bearing on the question of whether there are any things we can do or know

without learning them at all, but I understand that it won't be considered unpardonable if any member chooses to report interesting facts on any other topic. I will first call on Mrs. Ralston."

"Well, Stephen—or Mr. Chairman, I should say—I never did suppose that I should be asked to teach folks anything, and I declare I never should have thought of the things I have this week in the way I have if the questions hadn't been put just so. But when you come to think of it, breathing is quite a thing to do, but babies don't have to learn, and they know enough to suckle and to cry when they are left alone in the dark. They know how to put things in their mouths—mine knew too well—and I'm sure nobody has to teach them to ask questions or to look into every new thing they come across. So there are some things sure."

"Does any one wish to deny the correctness of Mrs. Ralston's observations or to oppose any contrary facts?"

"I'm not sure about the asking questions," said Mr. Henshaw. "In the case of our Robert, it seemed as if he did learn to ask questions by imitation, and kept it up because he liked to have you talk to him—liked to talk himself, too. I also thought, as Mrs. Ralston spoke of children touching and moving and tasting and fooling with everything they came across, that it was lucky they did so of their own accord without having to learn to. If they weren't naturally curious that way, they wouldn't learn about their surroundings half so fast. You may have seen a scrap I put in the paper about a week ago, quoting a great

scientist, who said that children learned more about the world in their first four years than in any four afterward.''

"I see Mrs. Elkin has something to say. Mrs. Elkin.''

"I'm not sure, but I think that children walk without having to learn. It sounds preposterous, because we always talk about teaching babies to walk, but I really believe that they walk of their own accord, just because they are made so that they feel like it when the proper time comes. For don't you remember, mother, how the doctor told us not to let Helen stand or try to get her to walk, because he was afraid it might cripple her, and how one day when we did put her down with her feet on the floor she started right across the room? She certainly walked, and also certainly hadn't ever tried before. I think most mothers begin to urge children before their brains or muscles, or whatever it is, are ready.''

"I don't believe that can be so with most children,'' said Miss Clark, "or people would have noticed it.''

"That's a poor argument, Miss Clark, if you'll permit me to say so. It's very evident that we don't notice a quarter of what really happens.''

"And I've noticed just what Mrs. Elkin did,'' said Miss Atwell. "For a while I was a tutor to Dr. Prentice's daughter in New York. He was rather queer, and he wouldn't let Mrs. Prentice or the nurse urge the youngest boy at all. When I went there the child could stand up by a chair. I don't know how he came to do that—and one day a pair of cuffs on

the table caught his attention, and he walked right across and got them."

"Wouldn't it be a good thing to ask some of the people we know who have babies to watch them and see," said Miss Clark. "If children did really know how to walk when the right time came, I should think it was unwise to tease them to before they were ready. It might hurt their bones or something."

"That's a good idea," responded the chairman. "Now, are there any more cases of things we do without learning—do just because we are made in a certain way? Miss Clark?"

"I wonder how it is about talking. Is any part of the faculty of language born in us?"

"It can't be, because people born deaf don't talk," answered Mr. Elkin.

"And a child of English parentage talks all French, no English, if he's brought up among French-speaking people," added Mr. Tasker. "I do think, though," he continued, "that human beings differ from other animals in making a lot of different sounds —babbling, so to speak—and this they do instinctively—that is, without learning. That gives, I should say, the materials out of which imitation and learning can fashion language."

"You folks mustn't try to make out that nothing comes from learning," said Mr. Elkin, with a smile. "You have to learn the shoe business."

"If people were born knowing how much eleven times five was, and how to read and write, we'd lose our positions, too," said Miss Atwell to Miss Clark.

After the general laugh was over, Arthur Ralston spoke up:

"Mr. Chairman, if it's allowable to study human nature by comparing it to animal nature, I'd like to mention a few observations. It's evident that most animals can do rather complicated and seemingly difficult things without learning—without any experience. Last summer I visited a man in Mitteneaque who raised poultry, and I saw a hundred chicks which had been hatched out in an incubator. They had no one to teach them. There was no mother-hen for them to imitate, but they could eat and drink and run and jump and preen themselves and scratch. They would run and dodge when they got a worm. The young roosters, only a week or so old, would have mock fights. Strange as it may seem, they could all swim, too. The man had noticed it in the case of one who jumped out of a basket in which he was carrying it across a bridge, and had tried others. In fact, a ten-days' old chick can do a good many more things than a ten days' old baby. Animals evidently are like us, in doing some things without having to learn them."

"I was wondering, too, when mother spoke first, if we didn't have some of these instinctive acts, as I believe some one called them, in common with some of the lower animals. All of you who've lived on a farm know that young lambs or calves will run after anything which starts away from them slowly, and run away from anything which comes toward them fast. Now, haven't you many a time seen a baby run away when you try to catch him, with no real reason,

and we all know how they toddle after us if we are going away from them. It seems like a sort of gift common to human beings and some animals. And about the fooling with things and grabbing them and sticking them in the mouth, isn't a monkey just like a baby in that? I never thought of it before, but a monkey acts just about the same way toward any new thing that a baby does. Whatever meaning you give to the thing, it seems to me to be a fact, and one worth thinking about."

"I see," said Mr. Henshaw, "that we're likely to stir up more questions than we do answers; but I'm glad of it, for if we get our minds full of questions, we'll be on the lookout for facts. What is it, Miss Clark?"

"I don't see why if we never learn these things, we don't do them all when we're only a day or so old. But we don't."

"I think that points to a very important fact, but I don't think it's any argument to prove that we do really learn those things," replied Arthur. "I watched four of that man's chicks for a week, and they didn't scratch till they were several days old, yet I know they didn't learn to do it. When the time came they just did it. And it was so with Helen's walking. It seems to me it just is a fact that when the body or brain develops to a certain extent we do these things. Some things, like breathing and suckling, we do at the very start. Some things, like reaching and walking, come later. It seems to me that the habit of collecting objects, which comes later still, comes to children without their learning it from any one. It

seems to me that we just have to grant that these unlearned acts—instinctive acts, as we've called them—may come at birth or be delayed for a considerable while. Isn't that so?"

All agreed with Arthur, Mr. Elkin remarking that falling in love seemed to him a fine example of a delayed instinct.

"Falling in love, at least the first time, would be an unlearned thing all the same," he retorted when the company laughed at his example.

"If I may have one more word," said Arthur, "I'd like to ask whether these inborn abilities may not die out if they aren't exercised. Chicks naturally follow a hen, but if they don't have any chance to follow a hen in the first ten or twelve days, why then they won't go near one, much less follow it, if you do give them the chance. The act or instinct, or whatever you please to call it, has died out. Are ours that same way, I wonder?"

No one seemed to have any evidence, and it was suggested that in the future eyes be kept open for that sort of fact.

"I am interested to see," said Miss Clark, "what sort of thing in the brain corresponds to these unlearned acts. How is the connection between the nerve-strings made in these cases?"

"It wouldn't have to be made at all, would it?" replied Mr. Tasker, after a moment or so. "If we do these acts without having to learn them, it would mean that our brains had a lot of *ready-made* connections. They would be like a lot of permanent private telephone connections, or like nickel-in-the-slot ma-

chines. The sight of a small moving object stirs up the brain to cause the movement of reaching for it, just as the nickel makes the machine turn out a package of gum. If learning to do a thing when you see or hear or feel or think of something means that you build up a connection of some sort in the brain, doesn't doing a thing without any learning when you see or hear something mean that the connection is already built up for you, Miss Clark?"

"Yes, that seems right."

"It is now about time for this meeting to adjourn, and I therefore call for propositions as to what facts we shall look out for during the coming week. I take it for granted that we'll all bear in mind the questions discussed to-night and try to apply what we've learned. I myself would suggest that we notice any new thing that we do learn, and see how we learn it. I know that there are a lot of interesting questions about queer things in human nature, and I hope we can later get to the bottom of them, but I believe that we'd better see through the simple things first."

"I move that the chairman's suggestion be adopted, and that our next topic be, 'How did I learn to —— whatever the thing was?' " said Mr. Tasker.

The proposition was accepted, and the company broke up.

NOTES BY THE EDITOR.

We inherit certain connections between nerve-cells which make us act in certain circumstances in definite ways, without our learning how, or thinking about the matter at all, or knowing what we are going to do. Our inherited constitution makes

us breathe and suckle and smile and reach for things and walk and be afraid in the dark, just as it makes us sleep and digest food and grow. We call such unlearned activities, *instincts*, or *native reactions*. Such activities may appear before birth or at birth or be delayed till after birth. They may be transitory, that is, may stay for a while and then disappear if not exercised and rendered habitual. Some of them we have in common with a great many of the lower animals. Some of them are peculiar to the human race. On the basis of these instinctive acts develop all our later acquisitions.

An interesting account of them may be found in Wm. James's "Talks to Teachers on Psychology," pp. 45–63.

CHAPTER III

DIFFERENT WAYS OF LEARNING

"Mr. Elkin," said Miss Atwell, who was acting as chairman, "what have you learned this week, and how did you learn it?"

'Well, Miss Chairman, in order to be sure to have something to report to-night I took this chance of learning something that I should have learned long ago—to ride a bicycle! So far as I can recall the somewhat perturbed state of mind that I was in during the attempts, it was something like this. I'll make use in my description of a record which my wife kept at the time. I tried an hour each morning. The first morning I would sometimes fall over at the start; sometimes describe a short curve and then flop; sometimes go along with the front wheel wobbling for twenty or thirty feet. I poked with my feet, and pulled this way and that with my hands, without much, if any, idea of what I was doing. I felt good when I kept going; that was about all. The farthest I went that morning was about forty feet. My wife says that I made thirty-eight attempts, rode about two hundred and fifty feet in all, fell over at the start nineteen times, had eleven of those meteoric curved dashes, and eight rides—short and zigzag ones, however. This morning I rode five miles, falling off only four times, and then with fair provocation in the shape of a stone, a rut, a lot of sand and a terrifying

milk-cart. All I can say about the progress from the first attempts to my present skill is that the useless jerks and pulls of arms and pokes of legs and bendings of the body gradually died out, and the right way of holding and pushing and sitting became the regular thing. My wife's records of the number of tumbles each day, the longest trip made, etc., show that pretty clearly.

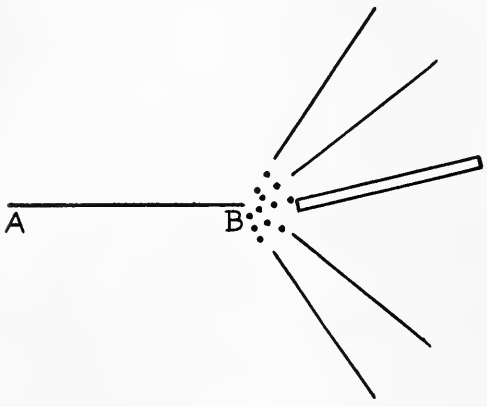


FIG. 5.

"I learned just by the try, try again method, with no explanations from any one and nobody to watch. Certain acts which kept me a-going, and so were satisfactory, seemed just to gradually become the natural acts, whereas at first they were only seldom done. I didn't think out how to do it, or about what my hands and feet were doing. What I thought of was just of keeping a-going. I've made some pictures which to me at least represent what happened. Let (in Figure 5) the line *A B* represent the feelings of sitting on a bicycle plus the desire to ride. At first these feelings lead to a lot of acts or movements represented by the other lines. Some of these make you fall or go crooked; others, which I'll represent by a double line, make you keep going and going the way you wish. After a lot of trials, these acts get connected with the feelings represented by

A—B, so that you do just those. When you've learned completely, your behavior is represented by a figure like this (Figure 6), where the connections leading to all the useless acts have been obliterated and the connection between the feelings of being on a wheel and the acts that keep you on have been strengthened. Learning to ride a bicycle seems to be the selection of one set of acts and the connection of them with a certain situation, and the mere satisfaction of success seems to be what does the selecting and connecting."

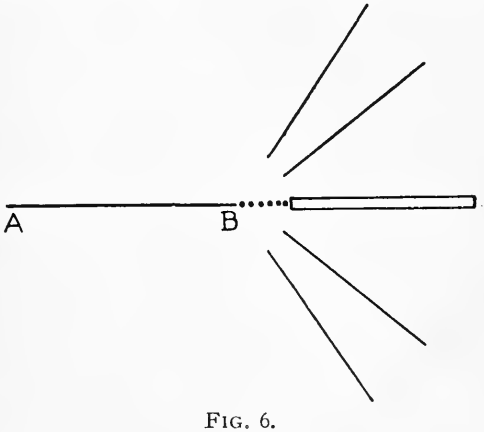


FIG. 6.

"Excuse me for interrupting," said Mr. Henshaw, "but isn't it largely in that way that we learn to hit a mark with a rifle-bullet or to dive? We just try and try, and the pleasure we get from successes stamps them in."

"I learned to have a decent 'touch' in playing the piano pretty much in that way, I think," added Miss Fairbanks; "but you go ahead, Mr. Elkin."

"I hadn't anything more to say. I've talked too long already."

"I call on Miss Clark to speak next. You haven't said much in the meetings so far, Helen."

"I shan't now, I'm afraid. All I've learned that was really a thing by itself was a new dumb-bell drill

in the women's class at the gymnasium. I learned the movements just by seeing them done, by imitation. They were very simple, and I didn't have to use the trial and error sort of method that Mr. Elkins did in learning to ride a wheel. I just watched the leader, and did as she did."

"Perhaps I'd better insert my observation here, too, for in my case the learning was to pronounce the French *an*, *on*, *ain*, etc., and it was a case of imitating."

"Was it, really?" said Mr. Tasker. "It seems to me that you combined Mr. Elkin's stamping-in of the successful acts with Miss Clark's imitation. You had the sound the teacher gave for a guide, and you made a lot of attempts. When you hit the right sound, your memory used the model to stamp it in, but you didn't learn how to make the sounds just from hearing and seeing them made, as Miss Clark learned the movements. Isn't there a difference between direct imitation and imitation where one uses the trial and error method plus the help of a model?"

No one objected to this distinction, and Mr. Tasker was called on next.

"I told you not to expose me," said he. "The sad fact is, friends, that I haven't learned anything this week, not even my Sunday-school lesson; I've been too busy getting a class started in geometry. However, I've certainly observed in others methods of learning which differ from the three mentioned so far. For example, I asked a boy to get me a test-tube. He said he didn't know where they were. I said: 'You go downstairs to room D, and look in the

first case on your right side as you go in, in the third drawer from the bottom.' He succeeded all right, showing that he had learned where to find the test-tube just from my explanation. He didn't have to make a lot of efforts, one of which gradually became assured, as Mr. Elkin did. If I'd sent him ten times afterward he would have done just the same. He learned how to find the thing, once for all, by seeing through the situation. He didn't have any one to imitate. He learned by getting the *idea* of what to do and remembering it. So I should say we had three main ways so far. Some things we learn by trial and occasional success, which gradually becomes assured; some things by imitation, the model being either directly influential or working to direct our trials; some things we learn by getting ideas—*i. e.*, from explanations."

"I fancy my report is like Mr. Tasker's, and I'd better put it in now," said Mr. Henshaw. "I learned how to keep off book agents this week. A friend told me that during three weeks while his children were sick and a 'diphtheria' sign was on the door, he was bothered by no tramps or book agents. I'm going to try it. My friends will learn by 'explanation' that the sign does not mean real diphtheria, while the book agents will have to depend on 'trial and occasional success,' and the result should be very satisfactory. But speaking seriously, I think we ought to notice that learning by having ideas of things covers a tremendous lot of cases. We learn arithmetic and geography; how to add and subtract and go to places and to avoid poisons; we learn the news; we learn

how to keep books; how to play chess and such games—in fact, a host of things by just getting certain ideas of things and acts. The model in imitation may just give us the *idea* of what to do or of how to do it. A person can 'explain' by an act as well as by words, and pure imitation would occur only in cases where the person did the thing without an idea of it by the mere force of witnessing the act in another—in cases, for instance, where a child gets St. Vitus' dance from being with a child who has it. But I'm keeping Mrs. Elkin and Mrs. Ralston from telling their experiences."

"Mine was of the 'idea' sort. Mr. Elkin wanted me to be able to open his safe, so he wrote out the combination, and I learned it because I didn't want to bother about saving the paper."

"Mine was of the 'idea' sort of learning, too. In connection with plans for an entertainment I had to know how much one hundred and twenty-eight times twelve and one-half cents was. I started to multiply it out, when Laura Keswick, who was with me, said right off, 'It's sixteen dollars.' I asked her how she got it so quickly, and she said, 'Why, that's easy. Twelve and a half is one-eighth of one hundred, so you just divide your one hundred and twenty-eight by eight.' I had to confess that I'd lived fifty-three years without having that idea of doing such an example in that easy way."

"Arthur, you are the only one left to report."

"The only new thing that I've learned how to do is to be able to tell the prices of eighty-two articles that our firm sells, without looking the matter up. It

was, of course, just a very simple case of getting ideas, of remembering each price in connection with the name of the article. When I receive an order for any one of them now, the idea of the price comes up in my mind, so that I make out the bill correctly. But I'd like to call the club's attention to some facts I've been thinking of while listening to the others to-night. Many things that we learn to do involve a *mixture* of the methods we've observed. When, for instance, we learn to play croquet, you start with a number of ideas that you get from explanation or observation, but you learn to aim correctly and to hit just so hard in any particular shot, from trial and gradual improvement. Moreover, I think you often unconsciously imitate the actions of other players. Learning to sing, also, is partly due to ideas, partly to gradually stamping in the right acts and abandoning the wrong ones, partly to merely imitating your teacher unconsciously.

My second point is that dogs and cats learn only by the gradual trial and success way. At least, I remember reading an article in the *Popular Science Monthly* which seemed to mean that. If you'll wait a minute, I'll get it and read part of it to you.

" 'So far we have seen that when put in situations calculated to call forth any thinking powers which they possess, the animals' conduct still shows no signs of anything beyond the accidental formation of an association between the sight of the interior of the box and the impulse to a certain act, and the subsequent complete establishment of this association because of the power of pleasure to stamp in any pro-

cess which leads to it. We have also seen that samples of the acts which have been supposed by advocates of the reason theory to require reasoning for their accommplishment turn out to be readily accomplished by the accidental success of instinctive impulses. The decision that animals do not possess the higher mental processes is reinforced by several other lines of experiment — for example, by some experiments on imitation.'[1]

"Apparently the chief difference between human nature and dog or cat nature is that we have the idea method of learning. If so, we ought to study it more carefully."

"Isn't the idea method of learning, as we've called it, a pretty big affair? We've noticed rather simple cases, but when you come to think of it, almost all of our school education, business training, original discoveries, scientific progress—in fact, almost all of civilization, which, I take it, means learning how to do a lot of things that savage peoples don't know how to do, is dependent on just getting certain ideas. We ought to notice just how we get these ideas. Why not observe for next time what happens when one acquires an idea, what causes it, etc.?"

"Good for you, Henshaw," replied Arthur; "but I'm doubtful about our getting the thing settled by our next meeting. I fancy we have a year's work before us if we're to observe everything possible about the way we learn to do things by thinking. We'll have to see how we remember and infer and guess and prove, and why we make mistakes and why

[1] *Popular Science Monthly*, August, 1899.

we fail to remember and infer, etc. It will be a fine thing to watch, though, especially for you teachers. But it's a complicated affair, simple as it looks. Taking Mrs. Ralston's instance, let us suppose that some one reads, 'In multiplying by certain numbers—*e. g.*, 12½, 16⅔, 33⅓—it is often convenient to add two ciphers and divide by 8, 6, 3, etc.' In order that this idea shall really bring about the proper results in his future conduct, he has to see the words or hear them, and we'll have to see how our senses work. He has to remember them, so we'll have to study what sort of things we remember best, how we remember at all, etc. He has to understand the meaning of each word and follow the points, and we'll have to observe our ways of comprehending things, see what they depend on, etc. He has to apply the thing to a particular case. It's wonderful how the common things that we take for granted are full of questions the minute you start in looking to see just what happens and why. There ought to be some books that tell about these things. Don't they teach about your senses and memory and that sort of thing in college, Tasker?"

"Yes, they try to. The science of psychology is supposed to discuss just such things, but judging from the books I read in college, I should say that it would perhaps be better, and would surely be much more fun, for us to keep on making our own observations and trying to think out what they mean, rather than to read any such books, at least for the present. My chum of sophomore year is teaching psychology in a college now, and if we get over our depth I can write and ask him to tell us where to find out

about the question in books. Besides, there's more in human nature than there is in the psychology books, I fancy. So let's keep on noticing human folks' behavior and discussing it, just as we have so far."

"What shall be our plan for the next meeting, then?" said Miss Atwell. "Shall we just keep our eyes open in general, or shall we observe ourselves and other people with some definite question in mind?"

"Hadn't we better do both, but plan to talk about only some one question? My wife and I find some bit of human nature to talk over almost every day now that we've started to keep a lookout, and we're saving all our observations until the club gets around to some topic that they bear on."

"I think Mr. and Mrs. Elkin have the right idea, and I suggest that we begin the study of the 'idea' way of learning by trying to see what part our senses play in the matter, how many of the differences in human nature are due to differences in hearing, seeing, feeling, etc."

NOTES BY THE EDITOR.

The method of learning by the selection of successes from among a lot of acts is the most fundamental method of learning, and is common to many animals besides man. The human infant learns in that way before he begins to imitate at all or to have ideas about things. We may take Mr. Elkin's drawings as representing in a rough way what does happen in the brain. The gradual increase in success means a gradual strengthening of one set of nerve-connections, and a gradual weakening of others. This method of learning may be called the method of trial and error, or of trial and success, or (from its importance in animal life), the animal method of learning.

The cause of such strengthening and weakening is the resulting pleasure in one case and discomfort in the others.

"Any act which is done in a certain situation and brings pleasure tends to be associated with that situation, and to be done when one is in that situation again. Any act which is done in a certain situation and brings discomfort tends to be dissociated from that situation and *not* to be done again."

Things which *we* would learn by the *idea* method, *animals* learn by this "trial and success" method. For instance, if we make a pen, as shown in Fig. A, and put a chick, say six days old, in at *A*, it is confronted by a situation which is, briefly, "the sense-impression or feeling of the confining surfaces, an uncomfortable feeling due to the absence of other chicks and of food, and perhaps the sense-impressions of the chirping of the chicks outside." It reacts to this situation by running around, making loud sounds and jumping at the walls. When it jumps at the walls, it has uncomfortable feelings of effort; when it runs to *B*, or *C*, or *D*, it has a continuation of the feelings of the situation just described; when it runs to *E*, it gets out, feels the pleasure of being with the other chicks, of the taste of food, of being in its usual habitat. If from time to time you put it in again, you find that it jumps and runs to *B*, *C*, and *D* less and less often, until finally its only act is to run to *D*, *E*, and out. It has, to use technical psychological terms, formed an association between the sense-impression or situation due to its presence at *A* and the act of going to *E*. In common language it has *learned* to go to *E* when put at *A*—has learned the way out. The decrease in the useless runnings and jumping and standing still finds a representative in the decreasing amount of time taken by the chick to escape. The two chicks that formed this particular association, for example, averaged one about three and the other about four minutes for their first

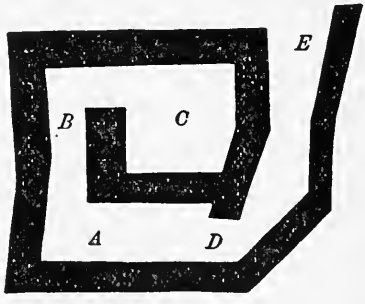


FIG. A.

five trials, but came finally to escape invariably within five or six seconds.

It will be well now to examine a more ambitious performance than the mere discovery of the proper path by a chick. If we take a box twenty by fifteen by twelve inches, replace its cover and front side by bars an inch apart, and make in this front side a door arranged so as to fall open when a wooden button inside is turned from a vertical to a horizontal position, we shall have means to observe such. A kitten, three to six months old, if put in this box when hungry, a bit of fish being left outside, reacts as follows:[1] It tries to squeeze through between the bars, claws at the bars and at loose things in and out of the box, reaches its paws out between the bars and bites at its confining walls. Some one of all these promiscuous clawings, squeezings, and bitings turns round the wooden button, and the kitten gains freedom and food. By repeating the experience again and again, the animal gradually comes to omit all the useless clawings, etc., and to manifest only the particular impulse (*e. g.*, to claw hard at the top of the button with the paw, or to push against one side of it with the nose) which has resulted successfully. It turns the button round without delay whenever put in the box. It has formed an association between the situation "confinement in a box of a certain appearance" and the impulse to the act of clawing at a certain part of that box in a certain definite way. Popularly speaking, it has learned to open a door by turning a button. To the uninitiated observer the behavior of the six kittens that thus freed themselves from such a box would seem wonderful and quite unlike their ordinary accomplishments of finding their way to their food, beds, etc., but the reader will realize that the activity is of just the same sort as that displayed by the chick in the pen. A certain situation arouses by virtue of accident or, more often, instinctive equipment, certain impulses and corresponding acts. One of these happens to be an act appropriate to secure freedom. It is stamped in in connection with that situation. Here the act is "clawing at a certain spot"

[1] Confinement alone, apart from hunger, causes similar reactions, though not so pronounced.

instead of "running to *E*," and is selected from a far greater number of useless acts.[1]

Concerning learning by imitation I have nothing to add to the club's observations. We do learn by imitation either directly or by a combination with the method just described.

As Mr. Henshaw says, the bulk of human activities are directed by ideas of one sort or another. This method of learning, the animals, with the possible exception of the monkeys, hardly possess. It is peculiarly human.

[1]Edward Thorndike, Woods Holl Biological Lectures, 1899.

CHAPTER IV

OUR SENSES

Mr. Henshaw opened the fourth meeting of the Human Nature Club by saying: "Arthur was telling me Wednesday of some general notions of his about the best way to look at human nature, and I took the liberty as prospective chairman of this meeting of asking him to prepare a sort of scheme showing his ideas. If he will tell us his view now, we can criticise it to our heart's content, and then go on to our own observations."

"Mr. Chairman, I have tried to settle a few points in my own mind, with the help of a book or two that I found in the Springfield Library.[1] The life of a human being seems to be a series of acts. We are in circumstances or surroundings or situations that change, and we act—or, to use a more exact word, react—to these situations by movements of our body or limbs, or of some part of us. All that we really do to the world about us and to other people is to make some movement. Giving a million dollars to a hospital is really just making certain movements with your fingers, resulting in your signature on a check. And the only importance of our thoughts and feelings and education and characters is that they make us *do* certain things in certain circumstances, make us react in certain ways to certain situations.

[1]The book was James's "Talks to Teachers on Psychology."

I mean by a 'situation' just the sights, sounds, tastes, etc., which you feel at the time. Give me any fact of human life that you please, and it can be expressed as a reaction to a situation. Give me anything in human nature, and its importance will consist in its influence on our movements."

"Then you would say that knowing arithmetic is important because it leads us when we hear, 'How much are nine times eighteen?' to move our throat muscles so that we say, 'One hundred and sixty-two,' or to make with our fingers the movements producing 162 or one hundred and sixty-two. You would say that knowing the alphabet really means the tendency to react to the request, 'Give the letters of the alphabet,' by saying or writing 'a, b, c,' etc."

"Yes; that's it. And the difference between any two people will be really that they react differently to the same situations. For instance, the difference between a thief and an honest man is that one reacts by taking things when the other would react by leaving them alone. The difference between Republicans and Democrats is that one class take a ballot which the other class refuse, go to a lot of speeches, read a sort of papers which the other class would avoid, move their hands together in clapping at a sentence which the other class would hiss, etc. For practical purposes, living equals reacting to multitudinous situations; by a man's character or nature we mean his ways of reacting."

"I don't quite see that that is universally true. Don't we have lots of thoughts and impulses that make up a part of our lives, but yet exert no influ-

ence on our actions? For instance, don't mothers have love for their children that they don't show? May not a boy *do* just the same things in school as another boy, and yet be of a different character? I always thought human nature — character — was something in us which might be there and yet not express itself in acts."

"Haven't you neglected my words *for practical purposes*, Miss Clark? If the mother's love didn't result in any act, if it never led her to do anything, no one except herself would be any different because of it. No one but herself could ever know that it existed. And so of any increase or decrease in its amount. I'll agree that there is room for difference of opinion, but I think that if we knew all a person's reactions to different situations, we should know the person's real nature. Your boy may perhaps do just the same things in school, but if he's really of a different character, I'm sure that out of school, and later on in school, he will show the difference in his actions. I don't think we have a right to imagine any sort of thing which mysteriously exists in us, and call it character. All we can *know* about it is its results on conduct, and these are just that the person reacts in certain ways to certain situations."

"It is fair to say in Arthur's defense that all the human nature facts we've discussed so far are facts describable by his phrase. Listen, for instance, to this. Our habits are just cases of similar reactions to the same situation recurring a number of times. We've learned also that we could react to a situation successfully without knowing much *about* the situation;

that we can make certain reactions without learning how; that in other cases we learn how to react properly by trial and success, by imitation, and by getting an idea of the reaction desired. I've used his words, you see, to describe the facts we've been studying, and they seem to fit. Don't those sentences sound clear and true? I suggest that we provisionally accept Arthur's way of describing human life until we find some fact which conflicts with it. Can you just summarize it, Arthur, and show how it may help us in discussing the use of our senses?"

"I should repeat that human life consisted of a multitude of reactions to situations. By a situation we mean what is around us, what happens to us; by a reaction, what we do, what movements we make. Our thoughts and feelings are an important part of our nature, for they have a share in deciding what reactions we will make. For instance, two men are walking down the street, one feeling hungry, the other not. The feeling will make one react to a restaurant by going in, while the other passes by. Our senses, in particular, make an enormous difference in the way we react, for if we don't see or hear or feel or taste or smell a thing, we won't react to it at all. Thus, a deaf man who is run over by a train is killed because he failed to react by getting off the track, the situation being 'train coming.' His failure was due to his failure to 'sense' the situation. In order to react properly to any situation, we have to feel it. Our sensations serve as the starting-point. If we didn't have eyes, ears, skin, etc., which were influenced by the outside world, by the situations in which

we are, we should be unable to adapt our actions to circumstances at all. As to learning by getting ideas, we couldn't learn, because no one would have any means of communicating an idea to us."

"I think this general outline will help us in describing our observations," said the chairman. "But first, are there any remarks concerning what we've said so far?"

"I think, perhaps, my observation ought to come first," said Miss Fairbanks, "because if we all agree that we can adapt our conduct to the outside world in so far as we have sensations, it seems worth while to see how far our sensations do parallel outside events, and how far people differ. I don't mean differences due to the absence of a sense entirely, as is the case with people blind or deaf or without the sense of smell, but differences in the range of a single sense. Now I've noticed that old people cannot, as a general thing, hear some very high notes which young people can. I remember, too, that one of my teachers at the conservatory told me that individuals varied in the range of tones they could hear. He said that the majority of people could not hear any tone much over six octaves above middle C, but that some individuals could hear tones an octave or more higher; that is, the situation 'air vibrating forty thousand times per second' would be felt and so reacted to by some and not by others."

"There's another kind of failure to get sensations, apart from general failure in a sense," said the chairman. "About two years ago I went to see my friend Arbuthnot, an army surgeon. When I reached his

office I found him sitting by a table on which were a lot of different colored skeins of yarn, eight or ten shades of each color and of gray.

"'Are you mending socks or knitting an afghan?' said I.

"'Wait and you'll see,' said he, and rang a bell. In came a recruit. (The surgeon was stationed at an enlisting station.) 'Pick out all the colors that are shades of that one,' said the surgeon to him, pointing to a green skein. The man passed this and other tests successfully, and was sent on. 'We test them for color-blindness,' said my friend. 'About four men in a hundred can't tell some shades of red and green. They don't see reds and greens as we do. Now, in the case of a soldier reporting signals, or an engineer running his train in accordance with different colored lights, such an inability might make a tremendous difference. If an engineer failed to see the redness in a light and reacted as if it were just an ordinary lantern, he might wreck a whole train.'

"Arbuthnot told me that all engineers on the big roads were tested for color-blindness nowadays. It's odd, but only very, very rarely is a woman color-blind."

"I used to know a young man that must be that way," said Miss Clark. "He was terribly slow at finding wild strawberries in the grass, and never could see a tree that had turned color early in the fall until you pointed right at it; and I remember that he'd call dresses brown when there was a lot of color in them. I never put the three things together before, but I suppose he must have been at least partly

color-blind. It's too bad you didn't see a case at the surgeon's office."

"But I did. Shall I take the time to tell you about it?"

"Yes! Yes!"

"Well, I had to wait over an hour, until Arbuthnot finished his office work, and during that time twelve men were tested. Eleven were all right, but one of them, though he got the bright shades of green all right, was very slow in finding the others, and didn't get them all. And he wasn't sure of some that he did pick out—at least, he'd hesitate. He would also pick out grays which had no green in them at all. That's quite enough about color-blindness, I'm sure, but let's keep our eyes open for some one who is color-blind, and then we can try the tests on him."

There was a minute's silence, broken finally by Miss Atwell.

"It strikes me that the facts mentioned so far show one general truth clearly—namely, that a person's senses only partially reveal the world to him, that the situation as he feels it is only a part of the real situation he is in. The color-blind person may *be* in the presence of green things, but he doesn't see the greenness. The old person may be in the presence of air-vibrations making high tones, but he doesn't hear them. Persons lacking a whole sense miss one whole aspect of the world. And even those of us who have all our senses in perfect order, still do not feel all the facts of the world about us. For instance, we here would all feel the same whether

there was an electric current passing through those telephone wires or not. That change in the outside world about us—*i. e.*, the situation we are in—would make no difference in our sensations. All sorts of things may be happening around us that our few senses don't take account of."

"By the way," interrupted Miss Clark, "I know of a man who can by the sense of smell tell which of his friends are in a room. You blindfold him and bring him into a room where there are three or four people of his acquaintance, and he rarely makes a mistake. I suppose he'd think we were smell-blind, so to speak."

"I was just going to say," said Miss Fairbanks, "that I believed there was something more to be said than that people differed in the range of sensations or in the lack of one sense or a part of one. I think they differ also in delicacy. In fact, I should think your friend differed from us in delicacy rather than in range. I've tried all of my pupils with a monochord at their first lesson by sounding a certain note and asking them to sound the same note. Some get very near it, within a tenth of a tone, while others are half a tone or more off."

"I remember a case where ability to feel small differences—delicacy of discrimination, I suppose we might call it—made a big difference in a man's reaction to a situation. I was in the office of a big tea importer at New York. 'I'll show you an easy way for a man to make ten dollars,' said he. 'Here are two samples of tea. I am offered both at the same price. Tell me which to take,' and he put a pinch of

each in a cup and added boiling water. I tasted both, and for my life couldn't see a bit of difference. 'No wonder they give you your choice!' I said; 'the tea is just the same.' 'Maybe it is,' said he, and rang a bell. The office boy appeared. 'Call Hopkins.'

"When Hopkins entered my friend said, 'How about these teas here, both offered at forty-two?' Hopkins tasted each carefully, and then replied, 'This one is worth at least two cents more than the other.' He had reacted to a difference in the tastes that I could not feel at all, and had saved his employer some sixteen hundred dollars. He was making his living out of his ability to discriminate delicately."

"Why not try our own abilities," said Arthur. "I think I can see a handy way."

"All right." "That's a good idea." "Go ahead," came from the company.

Arthur left the room, to return in a few minutes with a lot of sheets of paper, each with a line drawn on it, and a number of pencils. These he distributed. "Attention, every one!" he said. "You are to draw on the second sheet I gave you, below this line, a line of exactly the same length as the sample, but you mustn't measure."

Every one did this. Meanwhile, Arthur was preparing more sheets. These he gave out, and they repeated the experiment under his direction, each one doing it ten times.

"What made you have us do it so many times?" asked his mother, "and what's this for, anyway?"

"I'll show you in a minute. First, every one measure with these rulers," taking from a drawer

a box of rulers which Mr. Tasker had bought for the high school. "The line you were trying to equal was in every case ten centimeters long. Make a note of how many millimeters wrong you were—*e. g.*, if in a trial your line was three millimeters too long, call it +3; if three millimeters too short, —3." Every one did so.

"Let me see yours, Tasker, and shove over Helen's blackboard, will you. Let me have yours, too, mother."

He then put on the board Mr. Tasker's record and Mrs. Ralston's, as follows:

Mr. Tasker. Amount of Error.	Mrs. Ralston. Amount of Error.
+ 3 millimeters	+ 6 millimeters.
+ 4 "	+ 7 "
+ 4 "	+ 8 "
+ 1 "	+ 4 "
+ 4 "	+ 9 "
+ 1 "	+ 4 "
+ 5 "	+ 8 "
0 "	+ 9 "
+ 6 "	+ 7 "
— 2 "	+ 1 "
Total amount of error, 30 mm.	63 mm.
Average " " " 3 "	6.3 "

"Now, mother, you see why I asked you to do ten. It's to avoid mere chance and get a real estimate. On the whole, Tasker has a more accurate sensation of sight or movement, or whatever guides one in drawing lengths; but if I'd taken only one record from each of you, I might have struck the worst of his—that is, the +5—and the best of yours—that is, the

+1, and then we'd have thought *you* were the more accurate. Everybody now get your average error."

The club spent some time in comparing notes and seeing whose discrimination of lengths was most delicate.

"I wonder why Mr. Tasker's is the best record," said Mrs. Elkin. "Do you suppose he just has that gift, or is it because of his training?"

"The tea-taster's and the music-professor's delicacy of discrimination was due to training, and probably mine is, too. Probably in telling differences in taste, Mrs. Ralston would beat me all hollow. I used to suppose that it was just her fancy that led her to say, 'This pie is a bit sweeter than those I made last week.' I couldn't taste any difference, but now I really believe she did."

"I want to add again that just as there may be things in the world which we don't any of us feel any more than the blind man feels colors, so there are differences which none of us feel. Take these two

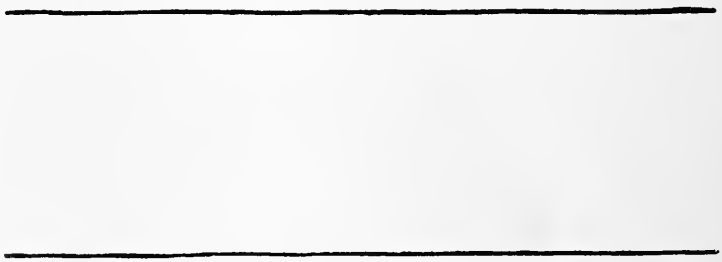


FIG. 8.

lines. I can't see that either is longer than the other, can you? No! Well, if we had a microscope and

a very accurate measure we would probably find a difference. You have one, Arthur? Good." She took the little magnifying-glass and looked through it at the lines. Yes, one is really much longer. Now, if I should make them so that under this glass they looked just equal, by taking a more powerful lens I'd find them really unequal. Accuracy, exactness, in things is never an absolute thing, if you come to think of it, is it? When we say that a singer's notes are absolutely true, we really mean that *we* can't distinguish any discord."

"If nobody has anything more to say about differences in the delicacy of discrimination, I'd like to tell of one more observation. Helen has a lot of colored papers that she plays with, and the other day I noticed that a piece of green paper when placed on red looks much greener, while red placed on green looks much redder. The green background will even make a gray look reddish, while the red background makes a gray look greenish. I wonder why that is."

"I've noticed that effect of contrast, too," said Miss Fairbanks.

"Red and blue-green are complementary colors," said Mr. Tasker; "that is, red and blue-green light, mixed together in the right proportions, make white light. Does your contrast effect come with yellow and indigo-blue, orange and blue?"

"It does with orange and blue. I never tried the other. I will if I can find those colors among Helen's papers."

"I can't explain it, but it's probably true of all complementary colors,"

"Isn't there a similar contrast in taste? Moderately sweet coffee tastes very sweet if you drink it right after eating a sour orange."

"Would it be fair to make the statement that we feel almost all things, not the way they are in themselves, but the way they are in relation to their surroundings? Just as a word's meaning is always due to a certain context, so a thing's feeling is always due to its context, to what has come with it. Sometimes a thing is emphasized, as with colors on a contrasting background; sometimes it is weakened, as when sweet coffee seems no longer sweet after maple sugar."

"I suppose we'd better stop soon, and do the rest of our talking by twos and threes. But we'd better first decide about next time. If other things besides the sensations one has influence his reactions, we ought, perhaps, to notice them, what they are, and what there is to be known about them, before we go on to Christian Science or hypnotism, or why some children are very like their parents and others very different from them, though I understand there are lots of observations on these and other points waiting to be reported."

"I quite agree with the chairman," said Mr. Tasker; "and I'd suggest that we all write out our observations and drop them into a box here. Stories are likely to grow if we don't put them on paper. We'll get around to them sometime. For the present, let's get at ordinary human behavior till we can partly understand it. Then we can go on to these more exciting questions. I hear that Mr. Henshaw has about a hundred observations which convince him

that the female half of human nature is of a lower order of intelligence."

"Not lower, but different," cried Mr. Henshaw.

"I hope you'll produce them. We can have a debate. But for next time let's ask just, 'What else besides differences in their sensations makes differences in human beings' actions?' "

With this understanding the meeting adjourned.

NOTES BY THE EDITOR.

The club's conclusions about sensations may be summarized as follows:

Our actions depend on our sensations:

(*a*) On the presence or absence of a sense.

(*b*) On the presence or absence of some special function of a sense—*e. g.*, green-vision.

(*c*) On the range covered by a sense.

(*d*) On the delicacy of discrimination.

There may *be* differences without our feeling them, and the same real difference which when added to one thing makes us feel a difference, may not be enough to cause such a feeling when added to another thing. Thus it would be easy to see a difference between a one candle-power and a two candle-power electric lamp, but impossible to tell the difference between a three hundred and a three hundred and one candle-power lamp.

Finally, our sensation of a thing may depend not only on it, but also on its surroundings.

We might say further about sensations, that in addition to sights, sounds, smells, tastes and touches, we have sensations of heat, of cold, sensations due to contraction of the muscles, strain of tendons, rubbing of joints, sensations of hunger, thirst, nausea, of changes of equilibrium, of pain, etc.

Complex sensations vary in quality according to the simple sensations involved, and these simple sensations show (1) differences between the senses—*e. g.*, between a sound and a taste; (2) differences within the same sense—*e. g.*, between red and

blue. Some of these differences seem differences of more or less of the same thing—*e. g.*, loud and louder tones, bright and brighter light, etc. These may be called differences in intensity.

These sensations are all due to action in the nerve-cells of the brain, aroused by action in the nerve-cells coming from our different sense organs. Nerve-cells starting in eye, ear, nose, mouth, skin, surfaces of the joints, tendons, glands, etc., run to the brain. At their outer ends they are set in action by light or heat or pressure or some other cause, and transmit this activity to their inner ends inside the brain, there making connections with other cells. (See Figure 2, page 11.) Thus sensations may cease for any one of several reasons. If a man's eyes are cut out, he can't see, because the outer ends of the nerve-cells are destroyed. If you leave his eyes unharmed, but cut the two bundles of nerve-cells going from his eyes to his brain, he can't see, because the activity can't be transmitted to the brain. The eye alone can't see. If you leave eye and nerve-cells, but cut out the place in the brain to which these cells go; i.e., cut out their connections with other cells, he can't see, because you've destroyed the connections.

Successful use of one's senses may in the same way depend on the condition of the sense-organ, of the nerve-cells from it to the brain, and of the cells with which they there make connections.

For a convenient account of our sensations, see (1) William James, "Briefer Course in Psychology," pp. 9-77; or (2) E. B. Titchener, "Outlines of Psychology," pp. 26-91.

CHAPTER V

THE INFLUENCE OF PAST EXPERIENCE

"We saw last time," said Mrs. Ralston, "that the way a person acted in any situation depended on the sensations he had. We were to have in mind this week the question, 'What else in a man besides the number and range and delicacy of his sense-powers influences the reactions he makes?'

"I presume you've all thought of the case which I have in mind, but just let me read it to you, so we'll have the exact facts in mind.

" 'A certain man went down from Jerusalem to Jericho and fell among thieves, which stripped him of his raiment, and wounded him, and departed, leaving him half dead. And by chance there came down a certain priest that way; and when he saw him, he passed by on the other side. And likewise a Levite, when he was at the place, came and looked on him, and passed by on the other side. But a certain Samaritan, as he journeyed, came where he was; and when he saw him, he had compassion on him, and went to him, and bound up his wounds, pouring in oil and wine, and set him on his own beast, and brought him to an inn, and took care of him.'[1]

"Now the priest and the Levite probably *saw* just what the Samaritan saw. Their sensations didn't differ from his, but their reactions differed tremen-

[1] Luke x. 30-34, inclusive.

dously. And the difference was due to their characters, their general attitude toward people. The same nerve commotions came from the eye to the brain in all three cases, but in two of the brains connections existed which caused the nerve commotions from the eyes to arouse acts of 'passing by on the other side,' sticking the nose up in the air and saying to oneself, 'I wonder when I'll be made a member of the Sanhedrin,' while in the Samaritan's brain connections existed which caused the pitiful sight to result in the acts described. If, as the doctor told us, we act as we do because of connections between certain sense-impressions and certain movements, I should say that a person's behavior in any situation depended not only on what sense-impressions he had, but also on what connections exist, on what sort of a brain the sense-impressions come *to*. I'm afraid this is all wrong, but I thought it all out and made Mr. Tasker tell me how to say it."

"It's all right, so far as I can see, Mrs. Ralston. If you take our old telephone illustration, you could say that the result of a message depends not only on what the message is, but also on whom it goes to, what wire the first wire is connected with at the central office. In the case of the priest, connection was made with Mr. Nose-elevating Muscle and with the office of the 'Pass by on the other side' Company.

"I remember a rather funny instance of the way just the same sense-impression can produce entirely different reactions in people, according to their previous education, which means, I suppose, according to the constitution of their brains, the connections

existing between nerve-cells. I once went with a friend to a spiritualistic seance. We sat beside two women, evidently believers. Various spooky forms emerged from the cabinet and spoke solemnly of the other world. The reactions of the women were bated breath and a tendency to tears. My reaction was extreme disgust mixed with a strong desire to laugh. What a person does in any situation evidently depends not only on the sensations he has, but also on the make-up of the mind that has them."

Fig. 9.

"Not only what he does, but what he thinks, you might add," said Mrs. Elkin. "I once gave ten cents to a little girl in the country, telling her to put it in the bank. Her thoughts in connection with the word 'bank' surely differed from mine, for she put the dime in the sand-bank by the road. If four of you will come into the other room, I'll try an experiment which I think will show how the effect of any sense-impression depends on the mind that receives it."

Mrs. Ralston, Mr. Elkin, and Arthur went out with her, and came back in a minute. Then Mrs. Elkin drew on the blackboard a figure like figure 9.

Mrs. Ralston, Mr. Elkin and Arthur smiled appreciatively, while the others seemed very much puzzled.

"I suppose you are wondering what makes these three smile, while you feel simply mystified. The

only difference is that I supplied their minds with a bit of information, built up some connections between their cells, I dare say. Now, I'll do the same for you. Listen and look at the figure. An artist once said that he could with three lines portray a soldier entering a house, followed by his dog."

The others now had their turn at enjoying the drawing. Mrs. Elkin continued: "I think that is rather a pretty instance of how just the same thing may arouse totally different thoughts according to the nature of the mind that sees it."

"Yes; that's very good. In fact, I think our point is now entirely clear, but I've thought up an imaginary story that I want to inflict on you. In New Orleans, at a theater, two men sat side by side. One was the president of the St. Clair Trust Company, another owned a block near the river. A man rushes in and cries out, 'The banks are giving way!' The first man rushes out to borrow money, the second to hire laborers."

"That's just my story in another form," declared Mrs. Elkin. "You're plagiarizing."

"Well, it's a good illustration, anyway."

"May I try to put all these facts into a few general statements?" said Mr. Tasker. "How is this? What we think or feel or do in any situation depends, first of all, on whether we feel the situation itself, on how our senses act, but it also depends on what ideas or acts the sensations arouse. Now the latter depend on our mental constitution, on our knowledge and habits, and these depend on our previous life. So that what we think or feel or do at any time depends

partly on all that we have thought and felt and done in the past. If we refer all this to the way our brains work, we shall say that our thoughts and feelings and acts are dependent, first of all, on what action goes on in the cells coming from eye, ear, etc., but also upon what sort of action this causes in the cells within the brain itself and the cells going out to the muscles. Now, here the whole previous life of these cells will make a difference. Just the same eye-action may make two brains act differently, because those two brains have acquired different make-ups. The same nickel may cause one machine to give out a piece of gum, another machine a piece of candy, because the machines are different. The result depends on the machine as well as the nickel, the brain as well as the eye or ear."

"I object to that statement on the ground of incompleteness. You talk as if all the cell-connections that had ever been made, all the knowledge and habits that a man had acquired during all his life, made a difference in the way he reacted to everything. But that isn't so. Mr. Elkin is a Presbyterian and in the shoe business. Miss Fairbanks is a Methodist and a music-teacher. I'm not anything in the church line and edit a paper. Yet by and by, when the chairman says this meeting is adjourned, we will all react in about the same way. Our vastly different previous mental lives won't make any difference. I write on the board, '*Homines pontes faciunt.*' The thing which decides what thoughts we will have in this situation—namely, seeing those chalk-marks—isn't our religious or business or political nature, but

just the presence or absence of a knowledge of Latin.

People may react alike if they are alike in a *certain system* of thinking which is concerned, even though they are vastly different in other respects. I say, 'How much are eight times five?' and five thousand people may react alike, and yet be of vastly different mental make-ups. On the other hand, two men may have thought and acted alike on ninety-nine per cent of the world's questions, but if one of them happens never to have learned arithmetic, their reactions to that question will be very different, for it is only that part of their mental constitution that's concerned."

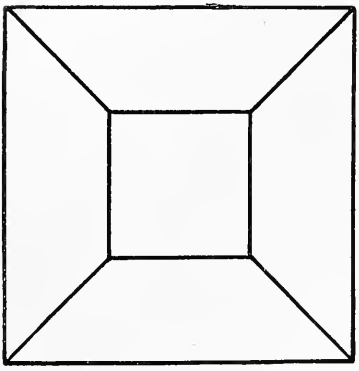


FIG. 10.

"You're quite right. The mind, the brain, is, of course, a tremendously complex affair, and not all of it is at work at once in any single situation."

"I have still another addition to make. The very same person may to the very same sensations react differently on different occasions, according to what thoughts are temporarily uppermost in his mind. Let me follow Arthur's example, and experiment on you. Please imagine a pyramid with the tip cut off sticking out at you from the board while I draw." He then drew a figure like figure 10 and quickly erased it. "What did you see?"

"A pyramid, of course."

"Was its small end sticking out toward you?"

"Yes."

"Well! Now imagine an open box, shaped like the pyramid, but with the small end *away* from you, while I draw again." He then drew the same figure again. "What did you see?"

"The box you told us about, of course; that's what you drew."

"Was its small end away from you?"

"Yes."

"Very good. I drew exactly the same figure in each case, but one sees it as sticking out or as hollow or even as a flat surface, just according to which idea you have uppermost in your mind. I noticed the thing I just tried on you years ago. It seems as if we could have certain cells temporarily half a-going, so that they are more likely to receive the commotion from the eye than others."

"That may be the reason why it's so hard to see mistakes in a letter that you've written yourself. Your mind is full of the thing you intended to write, and you see it, even if on the paper it's different. I have a trick of writing 'the' or 'they' for 'their,' and even when I re-read a letter I've written, I'll often leave the mistake in."

"You can make such mistakes, too, because of your general mental make-up, your previous mental life," added Miss Atwell. For instance, I picked up the paper the other day, and seeing the heading 'The School-Girl Question,' started to read that column. What was my surprise to find it was really 'The Ser-

vant-Girl Question.' My general bent of mind as a teacher had made me interpret my hasty glance wrongly. You, Mrs. Ralston, I suppose, would make the opposite mistake, in case you made any. The cell commotions coming from our organs of sense—that is, from eyes, ears, nose, skin, etc.—seem to serve as hints, which we interpret sometimes rightly, sometimes wrongly. The reception a sensation meets with seems to be about as important as the sensation itself."

"Do you remember the talk we were having at breakfast about Professor Larkin's lecture the day the club was started?" said Mrs. Elkin. "I said that it wasn't the eyes that saw, but the knowledge behind them, and Herbert backed me up by telling how Mr. Rogers could see at a distance of ten feet bugs and things that he couldn't see till they were pointed out to him. Our talk to-night has shown that we were right, hasn't it?"

NOTES BY THE EDITOR.

The club's conclusions in this chapter are all thoroughly scientific. What we think and feel and do in any situation does depend on the make-up of the brain the stimulus comes to, as well as the nature of the stimulus itself. (1) The general bias of the mind, (2) its particular equipment in a certain field, and (3) the ideas which temporarily possess it, all make a difference.

This fact is often referred to by the words *Apperception* or *Assimilation.*

CHAPTER VI

ATTENTION

Mr. Elkin, who was the chairman, opened the sixth meeting of the club by saying, "I didn't have to look far for another general influence on human conduct or behavior, or reactions, and I want to be the first to report to-night.

"I've been surprised again and again since Helen was born by occurrences like this. My wife and I would be sitting here talking, when all of a sudden she'd jump up and start for the door. 'What's the matter?' I would say. 'Baby's crying; don't you hear?' would be the reply, and off she'd go. If I listened attentively then I could hear the far-off squalling that is a necessary evil accompanying one of the best things in the world. But until then I hadn't heard a sound. Now, my ears are keener than my wife's, so that if it had been a matter of sensation, I should have heard first. It wasn't, nor was it wholly a matter of preparation. The difference was in her attention. As she used to say, she kept half-listening for the baby all the time. In thinking about similar facts this week, I've come to the opinion that differences in one's attention to his sensations and thoughts may make almost any difference in the reaction. I walked right into a tree the other day while I was thinking about some business matter. Now, my eyes were open and the tree was right in front of

me, so I must have had the sensations which would lead one to turn aside. I certainly know enough not to try to walk through a tree. Yet I hit it fair and square. The trouble was that I was attending to my own thoughts. So it seems to me that what we do, the way we act in the different circumstances in which we are, is decided not only by what sensations we get and what sort of previous experiences we've had, but also by the amount of attention we give to the sensations."

"I'm glad you've brought this matter up, for I had been thinking of the same thing in connection with the boys and girls at school. The thing that makes perhaps the most difference between pupils in school life is the extent to which they, so to speak, focus their thoughts on the subject at hand. In fact, this is one aspect of human nature that I'd studied a good deal before we started this club."

"Let's have Mr. Tasker give us a sort of a lecture on attention now," said Miss Fairbanks. "Then we can ask him questions and make him explain any observations we've made that seem due to it."

"Yes; that will be a good thing."

"It seems to me that I'm always talking here, but perhaps I do know a bit more about this particular thing than you do. First of all, I'm sorry you started out with the word 'attention,' for when we say 'Give attention to,' or 'I attended,' we don't really mean that there is any stuff 'attention' that we add to our sensations or ideas, or any sort of a performance 'attending' that we go through. We mean just the facts that (1) we assume certain bodily attitudes, that

(2) certain sensations or ideas are clear, while others are weak and indistinct, and that (3) certain impulses and ideas are checked, nipped in the bud, whenever they venture to appear. For instance, when a boy in my school is, as we say, attending to what I'm saying to the class, what really happens in him is, first, that he holds his head so as to hear me well, keeps the muscles in his ears tense, and very likely keeps his body rather still, and breathes differently from usual. This sort of thing is what I've called assuming a certain bodily attitude. In the second place, the sensations of sound which he gets from my voice are clear and emphatic to him, while the sounds from the street, the other boys' faces, the hot or cold temperature of the room, etc., are all more indistinct and weak. My words are, so to speak, in focus, while all the rest is out of focus. In the third place, supposing some one whispers to him, he may check the impulse to whisper back.

Now it is surely true that this boy will react differently to my words than a boy who sits listlessly, with now one thing uppermost in his thoughts, now another, not checking the aimless impulses that come up. He will hear them better, understand them better, remember them better. It is also clear, to take a case like Mr. Elkin's, that a boy who sat there with his ears strained to catch the whispers of the girl behind him, with her silly talk clear 'in the focus,' and my wise words vague and out of focus, checking all impulses to anything save listening to that girl, would react very differently from the first boy. He would be attending, but to the wrong thing, as was

Mr. Elkin in the case of the tree. Is this clear, so far?"

"How do you know that one's ear-muscles behave differently when one listens? The ears don't move, do they?"

"They do in some animals, and may tend to in us. But what made me think the muscles were tense was the feeling of relaxation in your ears which you have when you've been attending closely to sounds, but suddenly stop."

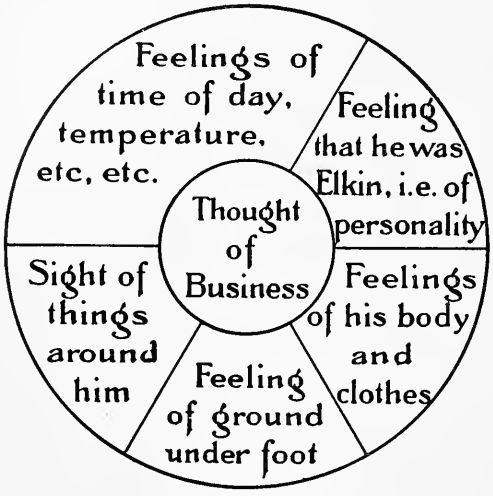


FIG. 11.

"I don't believe I ever felt that."

"Well, it doesn't matter. You'll agree there is some change of bodily attitude?"

"Yes; I just wondered about the ear-strain."

"To go on, then, the main thing to note is that any time we may have a number of things in mind, and that they are not all on a dead level, but that some one has the preëminence over the others, is clearer and more emphatic, and plays the leading rôle in determining our conduct, our reactions. Let me make a picture of Mr. Elkin's mind at the time he bumped his head against the tree. I'll put the clear, emphatic, possessing thoughts in the center, and the

vague, unattended-to thoughts outside. When he hit the tree there was a change. The shock and pain were so emphatic that they temporarily banished the thoughts about the shoe business to the margin, and usurped the central place—*i. e.*, were attended to. The main thing, I repeat, is this preëminence of one among many feelings. There may also be more or less of the bodily attitude and checking of other thoughts and impulses."

"Do you think that we always are absorbed—'possessed,' to use your word—by some one thing above others? When one lies on one's back in the grass on a summer's day, half-awake, half-asleep, thinking of a dozen things, but not thinking much of any of them, is there really any one 'focal' idea? Aren't they all on the same level?"

"I don't know about that. They seem to be. But maybe they do have preëminence, one at a time, but keep it only for half a second or so, and thus give us the idea that during any ten or fifteen seconds we've thought indifferently of a dozen things. I don't see how one can settle the question. Take your choice."

"Here's another question. Is there any fixed number of things one can have in mind at once?"

"I don't believe so. It seems to me that people differ greatly, that some boys in school, for instance, have what I call a 'broad thought-capacity.' They seem to have a lot of things in mind at once. Little Dodge, who was the football captain last year, seemed to be able to watch all twenty-one players at once. The same trait appeared in his school-work, too. On the other hand, some people seem to have a narrow

field of consciousness. Their thoughts go single file. They can only do one thing at a time."

"To come back to attention, I suppose we ought to try to find out what sort of goings on in our nerve-cells correspond to this prominence of one idea over others, but I confess I have only a guess, and can't find much about it in books. The bodily attitude is, of course, due to the action on the muscles of nerve-cells going out from the brain, the checking of other ideas and impulses. I found in James's 'Psychology' the following statement about that: 'The sense organ must . . . adapt itself to clearest reception of the object by the adjustment of its muscular apparatus.'[1]

"But as I said, for the mere superior clearness and emphasis of one idea compared with others, I have only a guess at an explantion. It is that in these cases the nerve-action *lasts for a longer time.* I have one observation which gives some little evidence for such a view. In the reveries we spoke of a few minutes ago, where no ideas *are* very clear or emphatic, we can have a lot of ideas in a short time, many more, I think, than we have when our ideas are of the clear, emphatic kind. So there seems to be a time difference."

"Don't you think, Mr. Tasker, that it is important to cultivate children's minds in this respect? I knew a little girl who seemed bright enough, but who just couldn't keep one thing uppermost in her mind. Any interesting sound or sight, any idea that crossed the margin of her mind, would drive out the arithmetic or piano lesson or whatever it was that she should

[1] Page 228.

have kept in the focus. The result was that she never learned to do anything very well, that she was always scatter-brained and seemed queer to other people."

"It is certainly highly important. I think it's a big part of education at home and at school."

"But how can you cultivate it? It seems to me that some people just are so and some just aren't."

"There's a good deal of truth in that. I can see in school that the nervous constitution a child is born with and the general state of his health both influence his power of attention. Still I'm sure it can be cultivated in two ways. The trouble with your little girl was that she didn't check, didn't nip in the bud—'inhibit' is the scientific word, I believe—the irrelevant ideas and impulses which came to her. Very likely the feeling of effort or strain which comes when we attend was intolerable to her. Now, one can improve oneself in this regard. One can learn to stand the disagreeable feeling of effort, to resist the attractions of irrelevant ideas, by beginning by doing it for a very short period; that is, you'd start in by attending to something—*e. g.*, a spelling lesson—for say ten seconds, and gradually increase the time. While you did attend to a thing, you'd attend to it exclusively, but if your power was weak, you'd not try to attend for long. Moreover, whatever you were trying to learn, you would learn by recall. Take spelling, for example. You'd have your little girl look at two or three words for ten seconds only, then try to write them down herself. This recalling things from within, instead of repeat-

edly reading them, gives one practice in standing the feeling of effort and in checking irrelevant impulses.

"The other way of improving ourselves along this line is by getting interested in the right sort of things. Most inattentive people aren't so much inattentive as attentive to the wrong things. The bad boy in school is generaly attentive. The trouble is that the object of his attention is the spit-ball or the girl in the corner instead of the algebra lesson. Our attention largely follows our interests, and we improve it by improving them, by making it pay to attend to the good things. We've all gone through such a process. When we were babies, we attended to the light of the lamp, the milk-bottle, to our food and drink and aches and pains. A little later the prominent objects for our minds were bright, moving objects, beetles and flies, tearable things, brass bands and hand-organs; later still, wading in brooks, robbing birds' nests and fighting; later still, athletics and parties; still later, our business or political party or church. Our interests change of themselves as we grow, and our playmates and parents and teachers and preachers change them for us. As I hinted before, I believe that a big part of civilization is just a change in the nature of the objects to which we attend."

"You could say, too, couldn't you, that a pretty fair measure of any individual's culture or intellectual make-up was the sort of things he attended to. A girl may have had every chance, may have been through college and gone abroad and absorbed a great deal of information, but if she chooses to think

chiefly of her looks and clothes, her culture won't be of much service to her or to any one else."

"Yes. In my opinion, what a person *selects* or *chooses* is always a better key to his make-up than what he *has*. However, we ought to remember that one's permanent interests, one's tendencies to attend, are largely dependent on what one *has*, on one's permanent store of knowledge. Ordinarily, if one fills his mind with a subject, he will become interested in it and attend to it. Another thing that I've often noticed is that sometimes just the notion of attending to a certain class of things may have a surprisingly big influence. Boys in school who have never thought of their physical development to any extent, are 'struck,' as we say, by the athletic craze, get suddenly the idea of attending to their own physique, and from then on they are constantly testing their strength, training, weighing themselves, etc. Or take ourselves, for example. I suppose most of us have in the last month paid more attention to our own actions and thoughts and to the ways they behave than we did in the year before. I was started on this new track by Arthur's famous observation, and I suppose my idea started you. Why I speak of these sudden changes in the nature of the things we attend to is because it is an aspect of human nature which seems to me practically important. It gives the possibility of reforming it, of a sort of sudden intellectual conversion. Change or improvement in the things which hold the preëminence in our minds need not always be as gradual as it generally is. For we

mustn't forget that a change more frequently comes slowly. What did you start to say, Henshaw?"

"Before we leave this topic of attention I'd like to call your attention to a fact Tasker has hinted at. We saw last time that what was in us, due to our previous thoughts and experiences, influenced our reactions. One way it does it is *by directing our attention*—that is, by making certain impressions clear and inhibiting others. In Tasker's words, 'One's tendencies to attend are dependent on what one has, on one's permanent store of knowledge.' He could have added, 'and also on whatever happens to temporarily fill the mind.' "

"It's time now," said the chairman, "to talk about our next meeting. The observation and question box has been filling up, but I know of at least one more factor that influences the reactions of human beings, and I think we'd better keep on the same tack a little longer. I suppose you all, in the meantime, are talking human nature and comparing notes on what you see just as we are here in the house. One thing the club has done for us is to relieve daily conversation from the burden of the weather, Helen's health, and the latest things in passementerie, mousseline de soie, overskirts, and polonaised gores of chiffon. There's been a mighty good change in the sort of things *we* attend to, I can tell you."

NOTES BY THE EDITOR.

The club's main conclusions are, as usual, scientific. Not so much the thoughts we have as the thought we have clearly in the mind's focus, count in determining our conduct. Mr. Tasker's description of this condition needs no amendment.

His guess as to its cause is only a guess, but a rather ingenious one. It is well to notice that we have two very different sorts of predominance in our ideas; first, predominance due to the intrinsic attractiveness of the idea, when we feel that the idea claims attention of itself; second, predominance when we feel that we *give* attention to it contrary to our natural impulses. The second sort has going with it a feeling of strain or effort. The first is often called *involuntary* attention, the second *voluntary*. Our aim should be, as Mr. Tasker says, to learn to stand the effort of voluntary attention, because there are always disagreeable things that must be done, and also to teach ourselves to enjoy attending (that is, to attend involuntarily without effort) to the right things. Pages 100-115 of James's "Talks to Teachers on Psychology" may well be read in connection with this chapter.

CHAPTER VII

MEMORY

"You said last time, Mr. Elkin, that you had noticed one more general factor that influenced human nature. What is it?"

"I'll tell you the exact observation, though it puts me in rather a bad light. About three weeks ago, Mrs. Elkin gave me a letter to mail, telling me at the time that it was very important. 'When the sense-impression of the post-office reaches your mind, you react by putting that letter in the box,' said she. Four days later I came home to find my wife's human nature decidedly upset. 'You look cross,' said I. 'No wonder,' said she. 'I wrote Miss Northrup to come here to-day and to-morrow to make up that dress I bought. She didn't come, or answer my letter even.' 'I'm sorry,' said I, 'but human nature can't always be relied on, and women have rarely any sense of business matters.' I pulled off my overcoat and took the newspaper out of my pocket. As I spread it open, a letter fell on the floor. My wife stooped to pick it up. 'You never mailed that letter!' she cried. 'You are the one that's to blame.' 'By George! I guess I am,' I said. 'That's too bad.' '*Women* have rarely any sense of business!' said she. 'You might at least pay enough attention to things to have your wife look presentable at a party.' 'Wife,' said I, 'let us not dally with the moral aspect

of this case, but let us treat it as an interesting fact of human nature. Why did I fail to react to the sight of that post-office? I did see it, I did attend to it; I did have previous knowledge to inform me that it was the post-office.' 'You're an unfeeling wretch,' said she. 'The least you can do is to buy me another dress.'' 'Inhibit that idea,' said I; 'check it at once. I failed to react, evidently, because of a failure of memory. The idea of a letter to be mailed did not come up in my mind. We must talk about memory at some future meeting of the club and find out how to improve mine.' 'You remember that new dress idea,' growled she, but she couldn't help laughing.

''So memory is my new general factor. We may feel and assimilate and attend to a situation—*e. g.*, a post-office—but if it doesn't call up the right idea to us, the reaction will not take place. And the kind of reaction that takes place will depend on the idea that is called up. Take four men walking by the post-office. Let them all see it; let all have previous experiences enabling them to recognize it; let them all attend to it. One remembers, 'I have a letter to post'; another thinks, 'I need some stamps'; another, 'The postmaster owes me five dollars'; while the fourth has no special ideas. Their reactions will all differ. Remembering is clearly an important part of human nature, especially for a married man whose wife writes important letters. I hope to get some new light on our memories to-night.''

''You need some new light on the folly of making weak jokes,'' said Mrs. Elkin.

''I'm glad,'' said Mr. Tasker, ''that you've started

up this topic, for I also had thought of these ideas which come up in our minds as factors in determining our reactions. Let's see what we can find out about them."

"If you're going to give the name 'memories' to ideas that are called up in our minds, it seems to me that you ought to have some other word for a sort of thing most people would call memory. For instance, we say that we remember how to play the piano, to swim, to dance, to play football. But here ideas aren't called up at all."

"Just what does happen in those cases, Miss Atwell?"

"If I've observed rightly, what happens is this: We learn to respond to certain situations by certain acts. In playing the piano, one learns to make certain arm and finger movements at the sight of certain notes. Now, this association or connection of an act with a sense-impression is more or less permanent, so that when a day or a year later we see those same notes we are able to make the same movements. Acts once learned can be repeated later on, just as ideas once in mind can later be remembered, be called up."

"Why not keep the word 'memories' for both, but call this thing 'memories of how to do things,' and the other just 'memories?' "

"I should say that it would be as well not to have any particular name, but just to call the facts what they are—namely, 'permanent tendencies to act in old ways'; or better still, 'permanent associations between situations and acts."

"Let's do that, then. Has any one any remarks to make about these permanent associations? Miss Atwell."

"There are two things which I thought about in connection with them, two respects in which they seem to differ from regular memories. In the first place, whereas in remembering the name of a place, or the meaning of a word, or anything of that sort, you either do remember it or do forget it, in these permanent associations you may neither remember nor yet forget. You may do something part way between. For instance, next spring I shall remember how to play tennis. I shall not play as well as last fall, nor so poorly as when I first began to learn. The associations formed between seeing the ball come at a certain speed and angle, and moving my body in certain ways, will not be so perfect as in the fall, but will by no means be entirely annihilated. I can relearn, can get back to my old 'form' in a short time.

In the second place, we seem to learn these things when we are *not* doing them. If you start to learn any physical game, you will find that very often indeed you do better after a day away from the game than you did the last time right at the end of practice. People even say, you know, that we learn to skate in summer and swim in winter, though that isn't true. But a day or so without practice often seems to help rather than hurt. I suppose the nerve-cells somehow grow to fit their new activities. That may possibly be true of our regular memories. Some people do say that things learned just before going to bed are bet-

ter remembered the next forenoon than if you learned them that day."

"I wonder whether your first point, that associations between idea and idea are either totally present or totally absent, while associations between idea and act are of all grades of strength, will really hold true. Although one seems not to be able to call up an idea at all when he has forgotten it, yet he might relearn the thing in a shorter time. I'd like to try an experiment with you on that. But wait till we get through to-night, and I'll tell you my scheme."

Since it took a number of weeks to finish the experiments which Arthur devised, the Editor takes the liberty of recounting instead of them some facts which Professor Ebbinghaus found to be true.

Professor Ebbinghaus made out a set of lists of nonsense syllables like this: *rig tab lud sem gat dov pem rol zin tuf*, etc. He would then read over one of these lists as many times as would enable him to repeat it from memory, counting the number of times it took. He would then relearn the same list after ten minutes, and see how many readings were needed this time. With other lists of equal difficulty he would do the same thing, only waiting, say thirty minutes before relearning. With other lists, he would wait an hour; with others, eight hours, etc. He found that *even when he seemed to have forgotten the thing, he could relearn it in a shorter time.* At the end of an hour, about half the original number of readings would suffice; at the end of nine hours, two-thirds the number of original readings; at the end of a month, four-fifths.

This shows that the permanent effects of learning ideas really do not vanish suddenly, but wear away gradually, just as do the permanent effects of learning to dance, swim or play tennis.

"Let's change our usual plan a bit to-night," said Mr. Tasker, "and first see what questions we'd like

to have answered about this calling up of ideas. Then we can bring up observations to help us answer them, and perhaps I can tell you of some observations by scientific men which I've come across. Of course a big part of teaching is getting ideas to come up in pupil's minds on the right occasions, so I've made it my business to look into this matter."

"The first question would naturally be, 'What happens in the nerve-cells when one thing calls up another?' wouldn't it?"

"I'd like to know what makes people differ so much in their ability to remember."

"And I'd like to know how to improve mine," added Mr. Elkin.

"I know a man who can remember people's names wonderfully well, but his memory isn't extraordinary in other lines. I'd like that explained."

"Why did I remember things when I had the fever that I supposed I'd utterly forgotten?"

"Now is the time for the question I asked at our first meeting, 'Why do some old people remember things that happened sixty years back better than things that happened the day before?' "

"Are there any more questions?" said Miss Clark. "If not, who can answer the first question?"

"I have a book here," said Mr. Tasker, "which answers it, I think. I'll read you what it says. '*When two elementary brain-processes have been active together or in immediate succession, one of them, on recurring, tends to propagate its excitement into the other.*' That is given as the reason why ideas call up each other. By brain-processes the author means commo-

tions in nerve-cells. He would explain the fact that 4×9 makes us think 36, by saying that the brain-process which gives us the idea 4×9 had in the past been connected with the brain-process giving us the idea 36. This connection is more or less permanent, so that when for any reason the 4×9 cell commotions are aroused they set off also the 36 commotion. 'They propagate their excitement,' as he says. We saw at our first meeting that our automatic performances were due to the existence of connections between nerve-cells; we've seen that our unlearned abilities were due to such connections which were born in us; we've seen that the way a man meets any situation depends on the sum total of connections in his brain, and we now see that the presence of these memories or ideas that are called up is due to the persistence of such connections and the arousal of one set of nerve-cells by another. Unfortunately for Mr. Elkin, the cell commotion corresponding to the idea 'letter to be put in box' wasn't aroused by the cell commotion corresponding to the sight of the post-office. The circuit was cut off, was not complete."

"You would say, then, that things which have been thought of together call each other up, and that the reason for this is that when two sets of nerve-cells have been active in connection, one set, if somehow excited to activity, tends to arouse activity in the other also; that we think of D, E after A, B, C for just the same reason that we put one arm into a coat-sleeve after we put the other in."

"Yes. And the reason that we forget, that is, that an object doesn't always call up what it has been with

before, is that these nervous connections fade with time."

"I can see that, but I don't see just what decides which particular associate an idea shall call up. Take the word 'post-office.' When you said it, I thought of John Wanamaker. Now, I have had hundreds of ideas in my mind at one time or another in connection with that word 'post-office.' Why did that particular one come up?"

"I should say that the one that had been with it oftenest would stand the best chance," said Mr. Henshaw. "A man's name is likely to make us think of his face; 1, 2, 3, 4, 5 makes us think of 6; 10×2 makes us think of 20; Manila makes us think of Dewey."

"But I had thought of other things in connection with the post-office more times than I had of Wanamaker. I think it was because day before yesterday Fred Collins and I were talking about some of the things he did as postmaster. Recency often determines which associate shall come up, doesn't it?"

"When Mr. Henshaw just said 1, 2, 3, 4, 5, I thought, not of 6, but of a problem my class had to-day which gave that answer. The children thought it funny to get just those figures in that order. That was recency, surely."

"It might have been something more than that. The way the children noticed the combination of numbers probably made a fairly emphatic, vivid impression. When Mr. Henshaw said Manila, I didn't think of Dewey, but of a very dear friend of mine who died there. It was long ago, so that recency had

nothing to do with bringing that idea up. Probably the importance of the experience which connected the word 'Manila' with the thought of that friend made it suggest her just now."

"We'll have to put it this way, then: Other things being equal, the most habitually, the most recently, and the most vividly connected idea will be the one called up. And let's by next week have a number of actual cases of thoughts called up and test this rule."

"I'd like to give one case now, Mr. Henshaw, because it doesn't seem to fit any of these three," said Mrs. Elkin. "I know a woman who has occasional gloomy periods, fits of very blue blues. Now, if you should say to her then, 1, 2, 3, 4, 5, she wouldn't think of any common associate of those numbers or of anything recent or vivid. She'd probably sigh and say, 'Five years is more than I want to live.' If you spoke of 10×2, she wouldn't think of 20. Oh, no! She'd say, 'I believe I have ten hundred times as much trouble as any one else.' Whatever idea came up, you can be sure it would be a gloomy one. And I think we are all made a good deal after that same plan. If our mind has for the time being a gay or sad or bitter attitude, the ideas which are called up will conform to it. They seem to be called up in harmony with our emotional tone."

"That *is* true in my case."

"It is with all of us, I guess," said Mr. Elkin. "We'll have to add that as a fourth rule."

"We ought to remember, also," said Mr. Tasker, "that in all this we've been having in mind our natural, spontaneous flow of ideas, the way ideas are called

up apart from our own definite search for them. When a man starts in to think about something with a purpose, he doesn't just let ideas come naturally, but he controls the process. The case may be different then. Let's bear this in mind."

"Is any one ready to answer those questions which came up? Perhaps we'd better leave them till next time, and be surer of our opinions."

CHAPTER VIII

TRAINS OF THOUGHT

"We have some questions left over from last time. The first was, 'What makes people differ so much in their abilities to remember?' Who can answer it?"

"I think I can," replied Miss Atwell; "that is, if you'll give me time. People differ, at least the children at school do, in two ways. First, there are some in whose minds all sorts of connections between ideas stay much more firmly. I once had a girl who would remember a short poem from a single reading. Everything that she saw or heard seemed to make an almost indelible impression on her. She could remember one thing as well as another. Her general retentiveness was surely twice as good as that of any other child in the class.

"Second, there are some in whose minds certain things stay firmly, though other things don't. One of my boys will rarely forget anything you tell him about steam engines or railroads, though he forgets his arithmetic and spelling on the slightest provocation.

"Now, the first sort of difference—that is, in *general* retentiveness—is due to some general difference in the quality of the nerve-cells in the different people. I looked the question up in Mr. Tasker's psychology book. Professor James says there: 'Those persons . . . . who retain names, dates, and addresses, anecdotes, gossip, poetry, quotations, and all

sorts of miscellaneous facts, without an effort, have desultory memory in a high degree, *and certainly owe it to the unusual tenacity of their brain substance. . . . .*'

"But the second sort of difference is due to interest in certain facts which makes us attend to them, think about them, connect them in our minds with a great many other things. For any sort of facts, that person will have the better memory who cares about them, thinks them over and over. So with my boy with the engines; so with the politician who remembers names; so with the business man who remembers prices. This idea again I got from that book."

"Would that explain your question, Miss Clark, about the man with a good memory for names, but not for other things?"

"I don't know. He wasn't a politician, but he did, I fancy, pride himself on this ability of his, and so take an interest in names and think about them."

"Don't forget," said Mrs. Elkin, "to tell Mr. Elkin how to improve his. I've thought of making him learn twenty lines of poetry every day."

"That would be making him suffer without doing him any good," replied Miss Atwell. "That method has been tried and found wanting. It won't even make him remember prose any more easily, much less to mail letters. I know of a gentleman's training himself this way on 'Paradise Lost' for thirty-eight days. He tested his memory before and after by keeping record of the time it took him to learn some other poetry, and he didn't improve.[1] In fact,

[1]See James, "Psychology," Vol. I, p. 667, for a full account of the experiment.

I don't believe that our general retentiveness can be improved. James says it can't."

"How do people improve so much, then?" said Miss Clark. "Educated people certainly learn more quickly than uneducated."

"That could be due to several things. First of all, they improve in attentiveness, power of concentration, and that improves their ability to learn quickly. Secondly, they find out better ways of learning. They learn the main points first, and then fill in the details, instead of learning bit by bit. They also learn by recalling from within instead of just repeating a thing over and over. Finally, they develop interests in things, think about them, have a lot of connections ready for each new fact, and so systematize their memories. You folks should read the chapter on memory in James's 'Talks to Teachers on Psychology.'"

"There are two more questions, one about remembering long-forgotten facts when one has a fever, the other about old people calling up incidents of their childhood and forgetting things that happened only a few days before."

"I asked Dr. Leighton about that," said Mrs. Ralston. "He said that as to the first point he didn't know just why, but that somehow or other the disturbances in the brain due to the fever started into activity cell-connections which had been for a long while disconnected from the daily happenings in our brain. As to the second point, he said that as people grew old their nerve-cells often became less easily aroused into action, and that this fact might explain

old people's forgetting recent events. The cropping out of memories of childhood, he said, might be due to the waning of a lot of customary habits of adult thought. When these become weakened, the old, long-unused connections may again be active. He said, however, that this was only a guess, and that other guesses equally probable could be made."

"I have three rather interesting observations that may be worth reporting, two of cases of extraordinary retentiveness, and one of almost supernatural memory in a fever patient. I'm not sure of the truth of the last, though I found it in a reputable book. The first two cases are interesting because they show that a good memory may go with very low general mental ability.

"A young man who was feeble-minded and had only with difficulty learned to talk and to read, could, 'if two or three minutes were allowed him to peruse an octavo page, then spell the single words out from memory as well as if the book lay open before him.' He did this as well with a Latin book he had never seen, whose subject and language were both unknown to him.[1]

"A certain Pennsylvania farmer 'could remember the day of the week on which any date had fallen for forty-two years past, and also the kind of weather it was and what he was doing on each of more than fifteen thousand days.'[2]

" 'A boy at the age of four suffered fracture of the

[1]Drobisch, "Empirische Psychologie," p. 95, quoted by James, Vol. I, p. 660.

[2]Quoted by James from Henkle, "Journal of Speculative Philosophy," January, 1871.

skull, for which he underwent the operation of the trepan. He was at the time in a state of perfect stupor, and after his recovery retained no recollection either of the accident or of the operation. At the age of fifteen, however, during the delirium of fever, he gave his mother an account of the operation, and the persons who were present at it, with a correct description of their dress, and other minute particulars. He had never been observed to allude to it before, and no means were known by which he could have acquired the circumstances which he mentioned.' '' [1]

"Is that all concerning these special questions. If so, we'll go on. We are to each describe some spontaneous train of thought which we have had this week, and try to see in each case why the ideas were called up. Will you be the first, Miss Fairbanks?"

"I was on a trolley-car which was going very slowly, much to my disgust. I thought of the speed at which I had heard that the cars in New York ran. Then I thought about the trip to New York which I am contemplating, and wondered whether I could there get the exact shades of cheese-cloth that I want for the costumes in the tableaux."

"Suppose you explain that yourself."

"I should say that my thinking of the rate of the New York cars after thinking of the slow rate of the one I was on was just a case of two things having been together once, and so tending to call each other up. Then out of the whole thought, 'fast rate of cars

[1] Quoted from Abercrombie, "Intellectual Powers" by Carpenter, on p. 439 of the 'Mental Physiology."

in New York,' I attended mainly to the 'New York,' and it called up my trip because, though hundreds of other things have been connected in my mind with New York, this particular thing had recency and vividness and interest in its favor. Now, why I then thought of that cheese-cloth I can't say, but possibly I've been thinking of it so much that it's at present predominant in my mind and tends to come up on all sorts of occasions."

"Is there anything more to add? If not, will you please be the next, Miss Atwell?"

"I was clipping the dead leaves off our fern, when I suddenly thought of the quantities of wild ferns growing in front of our cottage last summer."

"Will you stop a minute, Miss Atwell?" asked Mr. Tasker. "How do you explain that?"

"I was going to ask the rest of you. The sight of *that* fern, or the thought of cutting off its dead leaves had never been connected in my mind with anything. In fact, I can't see that the thought, 'This car goes very slowly,' had ever before been connected in Miss Fairbanks' mind with the thought that in New York cars go fast."

"Can any one explain this instance?" said the chairman. "It certainly is a fact that seeing one dog often makes us think of some other dog, seeing one senator of some other senator, etc., just as one car-speed reminded Miss Fairbanks of another, and one fern reminded Miss Atwell of others. Yet in lots of these cases, if not in all, the two things haven't gone together."

After a brief pause, Mr. Tasker spoke. "If you

are baffled, it's not your fault. I should be if we hadn't been all through this thing in college. The point is that not all of your idea is operative, counts, plays a part in calling up the next. In Miss Atwell's case the sight of the scissors, the deadness of the leaves, the peculiar properties of that fern cut no figure. It was just the general fern appearance, or still more likely, just the word *fern*, that cut any figure in calling up the next idea. Now, the word *fern* or the fern appearance *had* been connected with all those ferns by the summer cottage, had been together with them very often, had been their habitual associate all the summer.

"There can be all gradations in the amount of any idea which shall be operative in calling up another. When you think 'William McKinley,' and then think of his face, the whole of the first idea counts; when you think, as I did this week, of how Fred Nelson looked last Fourth of July playing first base, and then think that you owe him a letter, only a part of the first idea—*i. e.*, the name or face—counts; when you think of a football, and then of a balloon, only a fraction of the first idea counts, probably its rounded, inflated character. *A part* of the first idea is all of it that need have gone with the second idea. In college we were taught to call those cases where a good deal of the first idea had been with the second, cases of *association by contiguity*, and the cases where only some few parts or elements of the first idea had been with the second, cases of *association by similarity*. I don't, however, think much of these names."

"I take it we can all see now how one thing may follow another in our minds because it has gone with some part of the first idea. So we'll let you continue, Miss Atwell."

"Well, thinking of the ferns and cottage made me see in my mind's eye a sunshiny day, and then a picture of the blue bay we see from the cottage, and then of a storm on it, and then of myself in a boat, and then of a friend bailing out the water. Of course all these are cases of things which have gone with one another. The storm picture after the blue bay is, I suppose, a case where just the 'bay' counts. The vividness of the original experience probably made the boat picture come up."

"Miss Clark, what was your train of thought?"

"I tried to catch myself and see what I'd been thinking about, but I couldn't. Whenever I'd think of doing so I'd find I'd been thinking about nothing. I don't understand you people who have all these ideas running through your minds all the time. I don't believe I do. Finally I decided that if I couldn't get a natural train of thought, I'd just make one come. I said to myself, I will think of a pile of one hundred dollar bills six inches high on that table, all belonging to me, and see what thoughts come afterward. I thought of getting a number of things and of going to Europe. I couldn't at the end remember just what I did think."

"I'm afraid that your observation isn't exactly suitable for discussion, then," said Arthur: "so I'll call on you for your report, Tasker."

"Tuesday night I dined with the Ritters. I'll say

now, as it's important for what comes later, that we talked considerably about various literary topics. On leaving the car on the way home I found that it was raining, and on crossing Milbank Street I felt the dampness through my thin shoes. About thirty or forty seconds later I found myself thinking of the lines Othello speaks just before he kills himself:

> "Say that in Aleppo once
> When a malignant and a turbaned Turk
> Beat a Venetian and traduced the state,
> I took by the throat the circumcised dog
> And smote him, thus."

Luckily I thought of the club, and traced back the train of thoughts which connected these two very different ideas. It was this way. Noticing that my feet were getting wet called up the scene in George Eliot's 'Silas Marner' where Geoffrey goes out into the storm in his dancing-pumps. I then thought of Brunetière's opinion that George Eliot's novels were realistic in a truer sense than were Zola's. Then came the memory that a year ago, when I was in Cambridge studying, Brunetière had lectured on Molière; then the memory that my brother had not been able to understand the spoken French well enough to give me a definite opinion of Brunetière; then the thought of a certain man who had gotten the tickets for my brother and several ideas about this man. Then came the idea that if Brunetière had been a fool, he might have paid English people a banale compliment by comparing Molière with Shakspere, and then the idea that perhaps some of the fine things in Shakspere which we esteem as

wonderful insights into human nature may really have been in the author's mind only barefaced devices for making a hit. Finally came the thought of Othello's last speech as a possible case of this, and then I started repeating the lines.

"Now remember that all this was totally spontaneous. If I hadn't thought of the club, and so traced the thing back and repeated it and so fixed it, I shouldn't by the time I reached the house have known that I'd ever had any of these ideas. It was almost like a dream."

"Your thoughts seem much more complicated than the others have been. They are more general, are thoughts 'of the fact that so and so is so and so,' instead of being thoughts of simple things. They seem more like our controlled thinking."

"Yes; and they seemed to me to show another thing. They show a tendency to cling to a certain system or family of ideas, in this case a literary system. The thought of George Eliot didn't call up any of the Georges I've known or any of the Eliots, but called up a literary associate. Even after my thoughts drifted to the characteristics of the man who got the tickets, they swung back again to literary matters. I should say, as a rash guess, that my after-dinner talk had aroused the literary part of me, and that therefore ideas from that quarter were more likely to come up than ideas from elsewhere. If I'd been talking about Mrs. A.'s lumbago and Mrs. B.'s consumption and my host's rheumatism, the wetness of my feet would probably have caused a sort of pathological and medicinal train of thought. I'm sure that

with me things run in systems, and the result of any idea depends a good deal on the system it enters."

"I know that to be true. What idea will come up in one's mind depends on the general aspect or flavor of one's thinking at the time, as well as on the particular idea that has gone before it. We practically said that much when we were talking over the case of the Good Samaritan and others."

"I wonder," said Mr. Henshaw, "whether the rest of you are like me in always having your thoughts run in systems in this way. I often think it is absurd for me to speak of my 'mind,' for I'm sure I have a dozen or more. What I think about at any time is sure to be decided in great measure by the system I'm in, just as Tasker's being in his literary system made wet feet suggest a scene from a novel to him. The way I look at things, my talk, conduct, temper, and all vary with the different 'systems.' I have an office system, and when I'm in that I look at everything as copy for the paper. I sometimes believe if I were dying when my mind happened to be in this particular system, I should not bother much about it, but should be rather glad to have the chance to describe the feelings of approaching death. I have a home system; a summer vacation system, where I drop all traces of civilization and steal and poach like an Indian without a trace of remorse; and so on and on. The remarkable thing is that I can change from one to the other more quickly than I can change my overcoat. But I'm straying from the point, which is that the kind of system you are in plays a large part in determining what you will think of."

"Before we go on to the topic of non-spontaneous, controlled trains of thought," said Arthur, "it may be well to sum up what we've seen so far this evening. A number of concrete cases of reveries or trains of thought, or associations of ideas, have enforced the fact that thoughts which have gone together tend to call each other up. We have found that frequency, recency, and vividness are, as we thought last week, favorable factors. We have found, also, that not the idea as a whole, but only a part of it, need have gone with the idea which it calls up. We have seen in Tasker's case, how mere reverie may be about very general matters, and that, further, mere reverie may be a good deal like voluntary, controlled thinking. We have seen that the mind has various *attitudes* or *systems*, and that what idea will come up in any case is frequently dependent on what system or attitude is then prevailing."

"How many observed in themselves cases of controlled, purposive trains of thought? What was yours, mother?"

"I was writing a letter."

"And yours, Mrs. Elkin?"

"I was thinking about where to go this summer."

"And yours, Miss Fairbanks?"

"I was trying to devise some way of lessening my budget. I want to save some money."

"And yours, Tasker?"

"I was working out a problem in geometry which I found in an English text-book."

"And yours, Mr. Henshaw?"

"I was writing an editorial."

"Now I am going to surprise you all," said Arthur, "by telling you just the process of thinking you went through. It was alike in all cases, and it was this. You started out by fixing your attention on the thought which had started you on the work. If any other ideas were called up by it, you took a sort of quick look at them, and if they weren't harmonious with, useful for, the general aim you had in mind, you promptly inhibited them, didn't attend to them any longer. If they did fit, you attended to them and let them call up whatever ideas might come. And then re-occurred the same process of selection. The ordinary spontaneous flow of ideas is at the bottom of voluntary, controlled thinking. If it doesn't provide any ideas, you can't do anything at all. From what it gives, you can select, and thus influence the next spontaneous lot. You can't *have* ideas by wanting them ever so badly; you can only choose from what turn up. How is that? Am I right?"

"That's just about what happened in my case," said Miss Fairbanks. "I started with the thought, 'How can I spend less?' and up came the idea of buying fewer gowns. That brought up the idea of a lovely one I saw last week, but of course I inhibited that, and held on to the 'fewer gowns' idea and to my orginal question, which suggested one by one the ideas 'walk to town instead of riding,' 'stop all candy and flowers,' 'buy no books or magazines,' stay at home in the summer,' etc. With these came other irrelevant ideas, which I inhibited."

"Your description fits my case all right," added Mr. Henshaw. "I started with the idea, 'The duty

of the city to its library.' A lot of ideas came up, some mediocre, some totally off the question. None were good. Finally I reached a point where nothing came at all, and I gave it up."

"It fits mine, too," said Mr. Tasker. "I looked at the problem and a certain scheme for doing it came to my mind. I tried it a way, but it soon suggested another idea which showed it to be unavailing; so on with several notions, each being the starting-point for new associations, till finally one idea suggested another which did work."

"Does my account satisfy you, too?" said Arthur to his mother and sister.

"Yes; how did you make such a brilliant guess?"

"I didn't. I cribbed it from Tasker's book. Listen: 'From the guessing of newspaper enigmas to the plotting of the policy of an empire there is no other process than this. We must trust to the laws of cerebral nature to present us spontaneously with the appropriate idea, but we must know it for the right one when it comes.' "[1]

"This meeting, friends, has already been too long. I declare it adjourned."

[1]See James's "Briefer Course in Psychology," p. 275.

CHAPTER IX

MENTAL IMAGERY

"You were all," said Arthur, "talking a good deal last week about seeing in your mind's eye blue bays and stormy seas and people's faces and what not. What do you mean? I can't *see* anything unless it's present."

"Yes, you can. For instance, just think of the way the breakfast-table looks. Close your eyes. Can't you see it?"

"No; I can get little glimpses of one thing and another for about a quarter of a second apiece, but I can't in any sense see it as I do the real table, and I don't believe you can."

"Certainly I can. It is right out there, not quite so big as it really is. I can see every dish as clearly as if I were there. I could put my finger on the very nose of the teapot or count the scallops in the fruit-dish on the corner."

"Are all you people like that?" asked Arthur, in amazement.

"I'm not so good at seeing things when they aren't there as Mrs. Elkin is," said Miss Atwell. "I can see certain very common things, like the rooms at home, the faces of my friends; but I can't hold them steadily before me, or see everything clearly, and a good many things that I've seen I can't call up at all, except about as Arthur does.'

"Can't you see the picture before you when you read a description of a landscape or house or person?" said Mrs. Elkin. "For instance, take this:

> By night we linger'd on the lawn,
> For underfoot the herb was dry;
> And genial warmth; and o'er the sky
> The silvery haze of summer drawn;
>
> And calm that let the tapers burn
> Unwavering: not a cricket chirred:
> The brook alone far-off was heard,
> And on the board the fluttering urn:
>
> And bats went round in fragrant skies,
> And wheel'd or lit the filmy shapes
> That haunt the dusk, with ermine capes
> And woolly breasts and beaded eyes;
>
> While now we sang old songs that pealed
> From knoll to knoll, where, couched at ease,
> The white kine glimmer'd, and the trees
> Laid their dark arms about the field.

"I get patches here and there," replied Miss Atwell, "but I can't get a complete picture, much less hold it."

"I got practically no visual pictures at all from those words," said Arthur. "I can by trying work up a few images."

"I can't understand your case, Arthur. I don't see how any one can get any enjoyment out of poetry unless you see in your mind's eye the scenes described. Yet you do like poetry better than I. And I don't see what you mean by having an idea, say of a steam-engine, unless you have a picture of it before your mind's eye."

"When I think of a steam-engine," said Arthur, "I feel the sound of the word in my mind, and have also vague feelings of the word's significance—that is, feelings which, if I attended to them and followed them out, would grow into 'big and heavy, noisy puffs of steam, wheels, etc., etc.' Let me ask you something. Can you get mental images of tastes and smells? Can you imagine the smell of cabbage or onions now?"

"I can't," said Mr. Tasker.

"I can, easily," said Miss Clark.

"Well, we seem to be decidedly different in this matter of ideas of things when the things aren't there," said Arthur. "Suppose we start in definitely to see just what each one of us feels when he has what we've roughly called ideas. For instance, let each one think, 'Dr. Leighton will join the club soon.' What idea went with the *Dr. Leighton?*"

"I saw him," said Mrs. Elkin.

"I saw him, also," said Miss Clark.

"I saw the words 'Dr. Leighton' about a foot from my eyes," said Mr. Henshaw.

"I merely felt myself articulating the words," said Arthur, "and hearing their sound."

"It was about so with me," said Miss Atwell

"Now think this thought," said Arthur. "'The band played Yankee Doodle Came to Town.' How did you feel?"

"I imagined the sound of the melody and the sight of a band with red coats," said his mother.

"My thought of the 'Yankee Doodle' was of its sound," said Mrs. Elkin.

"I saw the words, as before," said Mr. Henshaw.

"I don't believe," said Mr. Tasker, "that we're getting much out of this, except that people differ very widely in the nature of their ideas or mental images. Suppose we leave this, and let me write to my college chum to see whether he can't tell us the important facts about it. I don't believe we know enough to clear this matter up. We can afford to take to-night to talk over the results of previous meetings." This proposal was accepted, and the meeting became informal.

The next week Mr. Tasker brought a bulky letter from his friend, and read it to the club.

"*My Dear Frank:*

"I was very much interested in what you wrote me about the Human Nature Club, and am very glad to send you some notes about our feelings of things when they are not actually present.

"We have feelings of sights, sounds, tastes, smells, touches, etc., when they are really present, which we may call sensations. We also have feelings of sights, sounds, movements, tastes, smells, touches, etc., when they aren't there in reality, but only, as we say, in our imaginations. Let us call these feelings mental images. Sensations, then, are feelings of things that are there; mental images are feelings of things that are not there, *and are known not to be.* When one imagines the taste of salt, he knows that the feeling he has isn't the taste of real salt. If, though there were no salt there, the man thought that he tasted real salt, we should say that he had a hallucination.

Thus a mental image differs from a hallucination in that the latter is a feeling of a thing as present, as existing, though it is really imaginary.

"Now, for every real thing you've had sensations of, you may have a corresponding mental image. If you've seen a monkey, you may have a mental image (here a visual one) of the monkey when he's out of sight. If you've heard a name or a noise or a tune, you may later have in memory a mental image (here an auditory image) of that sound or tune. If you've ever played tennis, and had the sensations of movement involved, you may later have mental images (here motor images) of those movements, and so on with the rest. For every kind of sensation there may be a corresponding kind of image. So we speak of—

(1) Visual images—*i. e.*, mental images of sights.

(2) Auditory or audible images—*i. e.*, mental images of sounds.

(3) Motor images—*i. e.*, mental images of feelings of movement.

(4) Tactile or touch images—*i. e.*, mental images of touches, pressure, rough, smooth, etc.

(5) Gustatory or taste images—*i. e.*, mental images of tastes and flavors.

(6) Olfactory or smell images—*i. e.*, mental images of odors, etc.

"Now, if we take any one of these sorts of imagination, we shall find that people possess it in very different degrees. In some it may be absent. Take images of smell. Some people have them very clearly, but I have absolutely none.

"Again, take images of movement. One man

finds that when he thinks of a soldier marching, he naturally feels images of movements in his own limbs. Another can only with difficulty call up any such images. So also one can imagine his hand to be icy cold, whereas another cannot. Individuals, then, as you found in your own club, differ very widely in the degree to which they possess each sort of imagination. You may find as much difference to exist between Mrs. Elkin and Arthur as between the two following cases, which I quote from James's 'Principles of Psychology,' Vol. II, pp. 56, 57.

"'The good visualizer says: "This morning's breakfast-table is both dim and bright. It is dim if I try to think of it when my eyes are open upon any object; it is perfectly clear and bright if I think of it with my eyes closed.—All the objects are clear at once, yet when I confine my attention to any one object it becomes far more distinct.—I have more power to recall color than any other one thing: if, for example, I were to recall a plate decorated with flowers, I could reproduce in a drawing the exact tone, etc. The color of anything that was on the table is perfectly vivid.—There is very little limitation to the extent of my images: I can see all four sides of a room, I can see all four sides of two, three, four, even more rooms, with such distinctness that if you should ask me what was in any particular place in any one, or ask me to count the chairs, etc., I could do it without the least hesitation.—The more I learn by heart, the more clearly do I see images of my pages. Even before I can recite the lines, I see them so that I could give them very slowly word for word,

but my mind is so occupied in looking at my printed image that I have no idea of what I am saying, of the sense of it, etc. When I first found myself doing this, I used to think it was merely because I knew the lines imperfectly; but I have quite convinced myself that I really do see an image. The strongest proof that such is really the fact is, I think, the following:

" ' "I can look down the mentally seen page and see the words that *commence* all the lines, and from any one of these words I can continue the line. I find this much easier to do if the words begin in a straight line than if there are breaks. Example:

Etant fait --------
Tous ----------
A des ----------
Que fit----------
Ceres ----------
Avec ----
Un fleur---------
Comme --
(La Fontaine, 8, IV)."

" 'The poor visualizer says: "I am unable to form in my mind's eye any visual likeness of the table whatever. After many trials I can only get a hazy surface, with nothing on it or about it. I can see no variety in color, and no positive limitations in extent, while I cannot see what I see well enough to determine its position in respect to my eye or to endow it with any quality of size. I am in the same position as to the word *dog*. I cannot see it in my mind's eye at all; and so cannot tell whether I should have to run my eye along it, if I did see it." ' "

"*Imagery connected with words.*—Most of our thinking is done in words, and so an important part of our imagery is our images of words. These may be (1) visual, (2) auditory or (3) motor. One person may see the word mentally, another may hear its sound, another may feel his larynx and lips and tongue move as they would if he said the word, another person's images of words may be a mixture of two or three of these. When, for instance, I think of any word, my image is partly of the sound of the word, partly of feelings in my mouth and throat. A blind person who had learned to read by touch might have touch images of words.

"As to your question about the superiority of this form of imagery over other forms, I would say that though visual images may often be handy, they do not seem to be necessarily the best sort of images. Some of the best painters have no visual imagery worth speaking of. Scientific men in general have far less of it than ignorant men. The real test of one's thinking about any question is the judgments he makes and the acts he is led to, not the kind of images he thinks in. If I meet a man who cries to me, 'Your horse has broken pasture,' it makes little odds whether I remember his words as a visual picture of a capering quadruped out in the road or as a picture of so many letters of type, or as a set of auditory images, or what not, so long as I judge that means must be taken to recover the horse, and act accordingly.

"To sum up what I've said:

1. There are as many different kinds of mental images as there are of sensations.

2. Not all people possess all kinds.

3. People also differ in the degree to which they possess any one kind.

4. A notable case of difference is in images of words. These may be visual, auditory, or motor, or a mixture of all three sorts.

5. No one sort of images need be better than another sort.

"I send a copy of Mr. Galton's questions concerning imagery. If you care to study deeper into the matter, the best way will be for every one to answer these questions, and then to compare notes.

"Very truly,

"Lawrence Stamm."

"I suppose that finishes this matter of memory and the side issues it has led us into," said Mr. Tasker.

"Not quite yet, I think," said Arthur. "I have an observation which seems to show that our study of ideas is still incomplete. We talked as if the question was, 'What imagery has a man?' 'What images of sights, sounds, touches, etc., pass through his mind?' That's not the whole story. The *image* one has of the word *man* is the same, no matter which of these three sentences you read, but your *thought* of man is different in each:

"'Man! how wonderful thou art!'

"'Man is a two-legged animal.'

"'Man! get out of my office!'

"The same word may carry different thoughts, because we feel not only the mental image, but also the reference or meaning it has. We feel in the first

case that we refer to or mean man in the abstract, a typical man; in the second case, that we refer to all men, mean any man that you chance to take; in the third place, we mean just the one tramp or loafer that is bothering us. Isn't that so?"

"Of course. The minute you think about it, you see that it's true," said Mr. Tasker. "I should say that often the feeling of meaning or reference is more important than the image itself. In fact, we couldn't think of men in general, dogs in general, houses in general, unless we had these feelings of the general reference of our idea. For instance, when we think, 'A stone house is an expensive thing,' the image may be of some one house or of just the word house, but we feel that we mean all stone houses."

"I'd like to call up one other thing before we consider the whole matter of learning by ideas complete," said Miss Atwell. "You remember that most of Mr. Tasker's ideas were 'ideas of the fact that,' and that in studying our deliberate thinking we saw that we generally thought in questions and statements, had feelings of 'is' and 'is not,' 'is like' and 'is unlike,' etc., feelings which we decided to call 'judgments.' Now, if it is true that most of our real thinking is in the form of judgments, it seems to support Professor Stamm's statement that it doesn't so much matter what sort of imagery we have so long as we get to the right judgments. I say, 'What did you have for breakfast?' Mrs. Elkin has an image of the table, and sees the different foods; Arthur sees no such thing; his image may be only of the sound of the words oatmeal, coffee, etc., yet his judgments may

be just as correct as Mrs. Elkin's. The important thing of all in correct thinking would seem to be, as he says, the conclusion you reached, not the kind of imagery which helped you to reach it."

"Is there anything more to be added? If not, I suggest that Mr. Tasker sum up for us all our conclusions about our learning things by ideas. We've been at this question for six weeks, and it won't hurt at least one of us to have the whole thing clearly in mind before we start on the miscellaneous topics of which the question-box is full."

The editor of the proceedings of the club finds Mr. Tasker's extemporaneous outline a little vague, and so has taken the liberty of modifying it somewhat.

People do some things—

(*a*) Without learning them at all, because they inherit the nervous connections which bring those acts to pass.

They learn some things—

(*b*) By trial and the confirmation of successes;

Other things—

(*c*) By mere imitation;

And still others, including most of our acts—

(*d*) By getting certain ideas, by thinking about the case.

This last sort of human activity is complex, and depends on a number of general factors, viz:

1. Sensations, or in terms of what happens in the nerve-cells, excitement of the brain processes from without, action in the cells coming from eye, ear, skin, etc.

2. Previous experiences, or in terms of what happens in the nerve-cells, the connections already established in the brain.

3. Attention, or in terms of what happens in the nerve-cells—we don't know what.

4. Memories, imagery, or in terms of what happens in the nerve-cells, excitement of brain processes from within.

5. Feelings of meaning and judgment, or in terms of what happens in the nerve-cells—we don't know what.

That is, a man's conduct depends on what outside things he feels, how he receives these sensations, whether he attends to them, what ideas or imagery they call up, what feelings of meaning go with these ideas and what judgments he makes. So each of these factors was studied by the club. Among the facts which they found out concerning them, the following are the more important.

A. Sensations.—Besides the commonly mentioned five senses, we have sensations of heat and of cold, of movement, of hunger, thirst, nausea, etc.

One sensation may differ from another in—

(1) Being of a different sense;

(2) Being of a different quality within the same sense;

(3) Being of a different intensity.

One person may differ from another in—

(1) The number of his senses;

(2) The quality of his sensations;

(3) Their range;

(4) The delicacy of his discrimination.

Our sensations are important not only because they furnish many of the feelings which cause and guide our actions, but also because they are the material out of which we construct our knowledge of our bodies and of the outside world.

B. The structure of the brain to which a sense stimulus comes, influences the reaction to be expected quite as truly as does the nature of the stimulus itself. The brain is modified by everything that happens to it, and so people with different previous experiences will in the same situation act differently. (1) The general bias of the mind, (2) its equipment in any particular field, and (3) the ideas which temporarily possess it, all may make a difference in the thought or action of the person.

C. Attention.—Our sensations and ideas are not all on an equality. Some are especially potent or predominant and occupy the chief places in consciousness. They are, we say, *attended to.*

What happens when this occurs is mainly that the 'attended to' ideas are clearly in mind and others are inhibited. In some cases the idea gains attention of itself, while in others we feel effort in keeping it clearly before us.

We improve our powers of attention by learning to attend without effort to the right things so far as possible, and to stand the disagreeableness of the feeling of effort where we have to.

D. Memory, the Association of Ideas and Mental Imagery.—Feelings are aroused from the inside in the form of memories and mental images, as well as from the outside in the form of sensations. Connections

once made between nerve-cells are more or less permanent. The retention and recall of ideas are due to this fact. Ideas which have gone with certain ideas are called up by them. Not all of the first idea need have been connected in the mind with the second. Sometimes only a part of the brain process corresponding to it has been connected with the brain process corresponding to the second.

If one idea has been connected with several other ideas, it will, other things being equal, call up its (1) most habitual, (2) most recent, (3) most vivid, and (4) most emotionally congruous associate. But (5) the mere accidental activity of the brain will often play a part, and (6) our ideas run in systems corresponding to different general mental attitudes, so that the particular system of thought which prevails will also help decide what idea shall come up.

In voluntary, purposive, logical thinking, the course of our ideas is determined by constant *selection* from among this spontaneous flow, and by the inhibition of irrelevant ideas.

The quality of the ideas that fill people's minds varies widely with individuals. Some have more visual images, others more auditory, etc., etc. The vividness and fidelity of these images are also subject to wide variation. It is not of much importance what kind or what degree of imagery one has, provided he is led to the right judgments and acts.

Feelings of Meaning.—The same mental image may exert widely differing effects on thought and action, according to the feeling of meaning or reference which goes with it.

The same mental image may *mean* a single definite object, or any object of a class, or a typical object, or an abstract quality. In our logical thinking, the feeling of meaning is often more important than the mental image or sensation itself.

CHAPTER X

OUR EMOTIONS

"To-night," said Miss Fairbanks, "we are going to find out what we can about our emotions, about love and hate and anger and jealousy and sympathy and patriotism, etc., etc. I have here the various observations along this line which have been handed in from time to time. I think, however, I won't read them all now, because they may come in more pertinently after we get started. There are two or three that point to the same fact, and we'll start with those.

"Why do we tremble and grow pale when we are afraid?

"I've noticed that when any one is very sad and gloomy his head is almost always a bit bowed, his breathing isn't full and deep, and there are wrinkles in his forehead.

"Why are some people able to conceal their emotions so much better than others; that is, conceal the bodily expression of the emotion?

"These questions all point to the fact that naturally any emotion goes with some change in the body. The thing is so common that we don't think about it, but when you do, it seems a very remarkable thing that when we feel sad our lachrymal glands should pour forth a fluid, that when we feel joyous the corners of our mouths should turn up and our hearts beat faster, that when we feel angry our teeth should

clinch. We certainly aren't taught to make such movements. We are taught *not* to, and we decrease them as we grow older."

"These bodily expressions of the emotions are instinctive, I suppose," said Arthur. "We cry or laugh or pucker our lips or breathe hard or contract our chest or blush without learning, just because we are born with brains which are so made that certain circumstances call forth these acts. They are on a level with the walking and reaching and curiosity of the human infant. The reason why emotions go with bodily expressions is that we are so made that they do. How we come to be made that way we'll have to leave to the people who know about that."

"You are quite right there," said Dr. Leighton. "These expressions of our emotions are born in us as a gift of nature. What bothers me is what the feelings, the emotions themselves, are due to. You taught me last time about sensations and imagery and feelings of meaning and judgment. One can see how at the bottom they all come from stimuli from the sense organs. But these anger, joy, sorrow feelings don't seem at all like them."

"Give me the floor for a while," said Mr. Tasker. "I've been saving up something I read over a month ago until the time was ripe, and now it will fit in perfectly. Our emotions *are* sensations, only they are sensations not from eyes or ears or nose or mouth alone, but mainly from our hearts, stomachs, intestines, lungs, muscles, blood-vessels, etc.—in a word, from what an old friend of mine calls our 'innards.' They are sensations of the bodily changes you've been

talking about. Just as a piece of sugar in your mouth gives you the feeling of sweetness, so a contracted chest, furrowed brow, stooping, droopy position, and a lot of happpenings in the heart, blood-vessels, etc., give you the feeling of sadness. Add to the outward noticeable bodily changes a lot of inward changes—which I'll presently prove do occur—and your sensations due to these bodily changes *are* the emotion. Listen to what Professor James says:

" 'My theory . . . . is that *the bodily changes follow directly the perception of the exciting fact, and that our feeling of these same changes as they occur* is *the emotion.* Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear and judge it best to run, receive the insult and deem it right to strike, but we should not actually *feel* afraid or angry.' " [1]

[1] " Briefer Course in Psychology," p. 375.

'Then if you stopped these bodily activities, you would stop the emotion, of course.''

"Yes, generally. Just as you generally stop the sweet taste by rinsing the sugar out of your mouth. A person might have a *hallucination* of an emotion, just as we saw some people to have hallucinations of sight or taste. We can in dreams have emotions without their appropriate bodily happenings, just as we have sights with nothing really to be seen."

"Why I asked was because this theory would explain an observation I made. Will you read it, Miss Fairbanks? I put it down exactly as the person told it to me. It's on that yellow paper."

Miss Fairbanks read: "I used to have sudden attacks of terrible dread. The emotion was tremendously strong, but I found that if I could regain my ordinary manner of breathing the dread would go away. Apparently the feeling was caused by the quickened heart-beat and spasmodic breathing, so that it died out as soon as I got them under control."

"Your theory would also explain a very rare case which I happened to have the luck to see," said Dr. Leighton. "It was a man in a hospital. His body was anæsthetic except the head; that is, he could not feel what went on in his trunk or limbs—*e. g.*, could not feel his heart beat or his chest move in breathing. The following was the substance of the physician's description of his emotional life.

"He is incapable of interest in anything whatever. Nothing gives him pleasure. 'I am insensible to everything; nothing interests me. I love nobody; neither do I dislike anybody.' He does not even

know whether it would give him pleasure to get well, and when I tell him that his cure is possible, it awakens no reaction, not even one of surprise or doubt. The only thing that seems to move him a little is the visit of his wife. When she appears in the room, 'it gives me a stroke in the stomach,' he says; 'but as soon as she is there, I wish her away again.' He often has a fear that his daughter may be dead. 'If she should die, I believe I should not survive her, although if I were never to see her again, *it would make no difference to me.*' . . . . Nothing surprises or astonishes him.'"[1]

"We would say that this man had no emotions because he hadn't any sensations from his internal bodily organs. He couldn't feel his heart-beats or diaphragm or any of the activities of his internal viscera (that is the scientific word for 'innards,' Tasker), and so had no emotions."

"But," said Miss Fairbanks, "if sensations of these bodily changes are the emotion, a person couldn't be angry unless these bodily changes occurred, could he?"

"No; and the facts seem to show that he can't."

"I don't think the facts *do* show that. We can be angry without showing it. Take a lady when some one spills a cup of coffee on her best gown at a party. She smiles, and says, 'Oh! that doesn't matter. It will come out all right,' as affably as you please, but really she feels like tearing the man's hair off his head. How can you explain that?"

[1]Dr. Sollier, quoted by W. James in the "Psychological Review," Vol. I, p. 528.

"You haven't shown that the *inside* bodily changes don't take place. She doesn't growl or show her teeth or clinch her hands, but her chest may be in a tumult."

"The facts may be as you men say, but it seems nicer to think that our emotions are caused directly by ideas. I'd rather think the feeling of sadness was caused by a sad idea; for then there's some sense in being sad. We are supposed to be rational beings, but on your theory we might be sad when we had no real reason to be, if only somehow the proper bodily states occurred."

"You've dug a pit for yourself, Miss Fairbanks, if you'll allow me to say so. We *are* sad when we have no real reason to be. One of the saddest women I ever saw had a fine husband, fine children, everything to make her comfortable, nothing to repent of. She was brought to the hospital when I was a medical student, her features drawn, her body bent, her whole expression showing the utmost anguish. When you asked what the trouble was, she'd say, 'Oh! oh! I don't know. I feel awfully, I feel awfully.' She was sad, though she had no sad idea that you could discover. After a few days her feeling of sadness created for itself an appropriate idea, but at first she was just possessed by a motiveless sadness.

"On the other hand, some of the happiest people in the world are poor wretched creatures who have the least right to be. Miserable men at the door of death from general paralysis of the insane, with no power or prospects left, will smile and tell you, 'I feel fine. I could lift ten thousand pounds. I never felt more delightful and joyful in my life.' "

"I see," said Miss Fairbanks, "that my comment was foolish. Just drop it, please, and go ahead as if I hadn't spoken."

"Professor James lays great stress," said Mr. Tasker, "on the fact that if you imagine an emotion, say a feeling of ludicrousness, and then remove from the picture of the emotion thus called up, all the bodily sensations—remove, that is, the feeling of shaking sides, of actual laughter, of open mouth, of head thrown back, etc.—you find that the emotion you imagined is gone, that all that is left is a mere judgment or notion that the thing is funny. So, he says, it would be with the real emotion. If we could take away the bodily sensations, nothing would be left of it save the mere opinion that the thing was amusing."

"Would he think that such feelings as the sense of duty, patriotism, interest, or the enjoyment of literature or music were due to sensations from the body, or wouldn't he include these finer feelings under the emotions?"

"He would say that if they had any richness and thrill of feeling about them, we'd find bodily sensations making them up. I myself don't see much sense in trying to think out what, for instance, 'the feeling of patriotism' is due to, for no two people mean just the same thing by the phrase. In one case it may be rapturous pride in one's country, and then you do find the swelling bosom, etc., of pride. In another case it may be just the feeling, 'My country is all right, and I'll stand up for it.' In this case there'd be really no *emotion* at all."

"Speaking of the enjoyment of music, one sometimes has a whole lot of bodily sensations mixed in as parts of his feeling, I think," said Miss Fairbanks. "And then, again, you'll have nothing but a sort of exalted sensory appreciation of the harmony."

"I don't believe," said Mr. Henshaw, "that we'd better try to clear up these subtle feelings like interest or the sense of duty or appreciation of a poem. They are off to one side of our general topic, the ordinary plain cases of typical emotions."

"I've been thinking," said Arthur, "that if our emotions are just sensations of our bodily condition, we can see clearly a way to control and educate them. If you want to get rid of the blues, throw back your shoulders, hold up your head, take deep breaths, smooth out the wrinkles in your brow, and you ought to feel more cheerful."

"You do, too. I've tried it. But sometimes you can't keep up the new bodily conditions. You fall right back into the gloomy attitude again."

"I was going on to say, if you wish to feel affection for some one and can't, you ought to be helped by always smiling and acting otherwise as if you liked them."

"I don't think that will work," said Miss Atwell. "And I don't think that in general your method of controlling emotion by controlling the physical expression will work except to a limited extent, for the very good reason that we can control only a few of the bodily conditions. The actions of all those *viscera* we talked about aren't much under our control. We can manage our breathing and a few things, but our emo-

tions depend on too many bodily activities that we can't control."

"You'll admit, though, that we ought to try this method as far as possible."

"Yes."

"I have another method to add to it," said Mr. Elkin. "A friend of mine claims that by just stopping and analyzing any emotion, by looking squarely at it, and noticing just how it feels, what it's made of, he can get over any emotion. He calls it taking a humorous view of himself. If he feels very angry when he doesn't wish to, he stops and sort of says to himself, 'Great perturbation, heated feeling, impulse to throw chairs. Remarkable state of mind. I'll feel my pulse.' He turns the tumult of feeling into a lot of elements, and that seems to stop it. I believe there's something in it, too."

"I don't," said Mrs. Ralston. "I think the best way is to avoid occasions that will excite any undesirable emotion, and to put yourself in such conditions as will naturally arouse the good ones. If a bad one comes, just don't attend to it; leave it alone."

"We have three recipes for controlling our emotions now," said Mr. Henshaw, "and they may all be successful, it seems to me. We may control the bodily expression, or destroy an emotion by picking it to pieces, or keep out of the way of bad ones and in the way of good ones. Let's all try the different ways and see how they work. I suppose a fit of the blues, or a case of bad temper or anything of the sort, will never again exist in the mind of any member of this club."

"It would be a good thing for Americans if they could control their nervousness and worry," remarked the doctor. "What would your Professor James prescribe for that, do you suppose, Tasker?"

"I don't suppose; I know. He has had that very question in mind, and says that making slow, calm movements, letting your muscles be quiet and flabby when you're not using them for some definite purpose, relaxing your brow and face into flat expressionlessness unless you really have something to express, will all help rid us of nervousness, because it—the feeling—is in part a feeling of muscular tensions. We would learn to take things easily mentally by taking our physical life easily. It will be worth the while of all of us to read the chapter entitled 'The Gospel of Relaxation,' in his 'Talks to Teachers on Psychology.' I have the book."

"I want to come back to the point from which we started out to study our emotions, their influence on our conduct. Isn't it true that people often have the *feeling* of sympathy without being thereby led to do anything sympathetic, the feeling of love without being led to act more kindly, etc.?"

"It surely is, Arthur," said Mr. Tasker. "I once tutored a boy who was brimming over with feelings of love for his mother, but who nevertheless amused himself by shooting at the parlor ornaments with his revolver. We all know folks in churches whose hearts are simply chockfull of fine emotions, from whom you can't get a cent or a stroke of work."

"I once was waited on by a committee of anti-vivi-

sectionists," said Dr. Leighton. "They wanted me to help their cause in certain ways, and they evidently felt terribly about the dear animals, as they called them. I wanted to see how much in earnest they were, so I said: 'Ladies, I am willing to give the amount of time and effort needed for what you desire, if, as I suppose, you are willing to help me in a certain matter. I know a child who can be saved from lifelong misfortune by an operation. It will cost about sixty dollars to get him to New York and back and buy what is needed.' The head of the committee rose majestically, and said: 'We did not come here to *bargain*, Mr. Leighton. If you don't choose to relieve the suffering of the poor dumb brutes of your own will, why so much the worse for you.' I bowed politely, and saved up the righteous indignation which I felt until they had gone."

"Isn't it fair to say," said Miss Atwell, "that our emotions are useful only as they give us innocent pleasure or serve as impulses to useful conduct? They seem to me to be in a way like steam. It isn't of any use for steam to just *be;* it must make some wheels go. If it just sizzles and hisses and displays itself, it only wears out the boiler."

"I believe that," said Mr. Henshaw; "and I don't see much justice in making a fuss over what people feel. If a man treats me and everybody else rightly, both when I'm looking and when I'm not, what do I care what he feels? If a man serves his country well, what odds does it make whether he feels throbs of patriotism or not? The action's the thing, and the

only value of the feeling is as an impulse to it. If you can have the right action without any feeling, you just save yourself so much chance of becoming silly."

NOTES BY THE EDITOR.

In this chapter three topics are discussed:

1. The cause of our emotional feelings.
2. The means of controlling them.
3. Their usefulness in human life.

Professor James is the authority for their conclusions about the first topic, and the editor thinks Mr. Henshaw's opinion about (2), as given on page 123, and Miss Atwell's about (3), as given on page 125, are as satisfactory as any equally brief statements of his own would be.

James's "Briefer Course," pp. 374–390, may well be read in connection with the chapter.

CHAPTER XI

PURPOSIVE ACTION

"It strikes me," said Mr. Elkin, "that we haven't yet touched on the most important aspect of human nature at all—the will. It doesn't make much odds what a man knows or how he feels, provided he chooses the right line of conduct, provided his will is healthy and leads him in the right direction. I'd like to know what makes the difference between a good and bad will, a strong or weak will. I've been on the lookout to see, but I have no observations worth reporting."

"What do you mean by a person's 'will'?" asked Miss Atwell.

"I mean whatever makes him do things."

"But we *have* touched on that. We found that a man did a great many things just because his nerve-cells were so connected that a certain situation led to a certain act. We breathe, cry, weep, laugh, etc., just because we inherit as nature's gift to us certain connections between nerve-cells and muscles. We also do things from imitation."

"I suppose I really mean the things that we do when we foresee and control our acts; when, for instance, we murder a man, or write a letter or buy a suit of clothes, all the really complex acts that we perform."

"But," said Arthur, "we can perform very com-

plex acts without really 'willing' to do them. You know you and I were talking about this thing the other day. Well, I decided to see how many things I really willed in a day. I found they were very few. As I got out of bed, I thought, 'Did I will to do that?' and observed that I hadn't. The mere sight of the clock gave me the idea of getting up, and up I got, without 'willing' anything. The mere sight of my clothes led me to put them on, and amongst all the numerous operations that I went through before I reached my seat at the breakfast-table, there was only one case of willing. I did deliberately decide to put on a certain necktie, because I wanted to wear the thing out. In that one case I felt that I really willed to do something. In all the other cases I either acted automatically or else the mere idea of doing a certain thing or the sight of some object connected with the act led me to do it without any decision or act of will of my own. So on through the day. The thought, 'What time is it?' suffices to make me open my watch without there being any exertion of will power or any feeling of 'Lo, verily, I will do so and so.' An idea calls up a movement just as an idea calls up an idea."

"You can see that rather well in some cases we doctors have to deal with," added Dr. Leighton. "Some people do things just when they *will not to*. A man came to me once who said, 'Doctor, either I'm the biggest fool on earth or there's something the matter with my brain. Every night I have to go down to lock the door a dozen times. I'll lock it and go to bed, and then up will bob the idea, "Go down and lock the door," and I'll find myself walking down-

stairs like an idiot. I will to stay in bed, but somehow the idea of looking after that door possesses me, and I have to work the idea out in action. The worst of it is that this absurd thing will happen ten, sometimes twenty, times in a single night.' It's evident that in such cases the mere idea of doing a thing suffices to bring the act to pass, apart from any act of will. We all, I think, have experiences which border on such morbid activity. Who, for instance, has not stepped over à crack in the sidewalk, or touched a lamp-post, or counted the globes in a chandelier just because the idea struck him. Our minds as a whole are healthy, and we don't follow out in action ideas that are too absurd, but we do tend to act out all the ideas we have unless we are prevented by some other idea. I well remember how once, when a boy, I saw a haystack, and was struck by the idea of setting fire to it. I had all I could do for a minute or two to withhold from the act. So I feel sure that we must agree with Arthur that we do all sorts of things, complex as well as simple, without willing or deciding about them at all. As he says, any idea that has gone with an act tends to bring about that act, just as an idea that has gone with another idea tends to call it up in the mind."

"That would go to show that the 'as a man thinketh in his heart, so is he,' was a good account of human nature, wouldn't it? A man with good thoughts would do good deeds, if, as you say, every idea tends to realize itself in action?" said Mrs. Ralston.

"Yes; provided that he had customarily done good deeds in connection with those thoughts. If, for

example, a man in a car thinks, 'That lady should have a seat,' and then gets up and if he *repeatedly* makes the connection between that thought and that act, after a while the mere presence of the idea, 'Give up my seat', will bring about the act without his willing it at all. But suppose he repeatedly has the idea, but on all occasions sits still. Then the presence of that good idea won't imply any good action."

"You could say, couldn't you," said Mr. Tasker, "that he had not only the good idea, but also another bad idea—namely, 'But I won't give it to her,' or 'But I'll sit still.' What were you going to say, Miss Atwell?"

"Nothing now. I was intending to say that people could be chockfull of fine thoughts and never put any of them into action, but you and Mr. Henshaw have explained that by showing that they've never connected these thoughts with the corresponding acts and may have in mind also ideas of *not doing* the good things they talk about. To turn back to our main question, I'd like to ask what happens when we really do intend or decide or will to do a thing. We all agree that in some cases this occurs, that we aren't always doing things just because an idea comes up in our mind that tends to work itself out in a certain act, or because of imitation, or because of inherited tendencies. We sometimes act deliberately as a result of choice. Now what happens in us in such cases?"

"Yes," said Mrs. Elkin; "take a concrete case and explain what happened in my mind when yesterday I deliberated whether to take Helen to Springfield to the dentist's or to stay at home and rest. I thought

of things on both sides of the question, and finally decided to stay and rest."

"You'd better try to explain it first yourself," said Arthur. "Then we'll all put our fingers in the pie later. At any rate, tell us what happened more exactly."

"Well, the idea of going to Springfield had been in my mind for some time. At breakfast I thought, 'I'd better take Helen this afternoon.' I then thought I would—that is, I had a feeling of consent, of 'all right,' of 'let it be so,' as the idea came to me. But at lunch I felt tired, and as I thought of the trip I recalled some advice Dr. Leighton gave me a while ago—namely, 'Do just as little as you can, Mrs. Elkin; don't do to-day anything you can put off on some one else,' and I felt, 'Shall I go or stay at home?' The idea of staying at home made me think of the comfort of a restful afternoon in an arm-chair, but also of my duty to have Helen see the dentist, and of a number of other things, attractive and otherwise. After about five minutes of such deliberation I thought: 'Well, it doesn't much matter; some more convenient chance will come than this awfully wet day. I'll stay at home.'"

"Just what was your feeling, Mrs. Elkin, when at breakfast you willed to go, and at lunch to stay? I mean just the feeling of willing."

"It seemed like a feeling of 'Do it,' 'Go ahead, 'Let it be,' a feeling of consent to the realization of the idea then in mind, as I called it a minute ago."

"Is that what we all feel when we will to do a thing?" asked Mr. Tasker.

"It is with the worst half of the Elkin family," said Mr. Elkin. "Instead of just having an idea and having it of its own accord bring about an act, as in the case we'd been talking about, you have, when you *will* an act, an idea *plus this feeling of consent.* You O. K. it, put in your mind a label 'approved' on the idea."

The rest of the company agreed with this description of the feeling of 'willing,' and Mr. Tasker continued, "If we could now see, first, how, when we deliberate or decide or choose, an idea gets this O. K., this label 'approved,' this feeling of consent, and second, why it then is acted out, we'd have a pretty satisfactory account of 'willing.'"

"That isn't so very hard to see, is it?" said Arthur. "Isn't it just a matter of attention? An idea, we've seen, tends to be acted upon if nothing prevents—*e. g.*, the idea of staying at home in the present case. Other ideas do prevent, by preventing it from monopolizing attention, from possessing the mind. If somehow an idea does become strong enough to gain total predominance, to absorb the mind, it will be acted out, and with the removal of the ideas that before checked it, with this whole-hearted acceptance of it, comes the feeling of consent you talk about. That feeling is much the same, so far as I can see, as the feeling of belief. In both cases there is the absence of feelings of contradiction—in one case of an opinion, in the other of a course of action. When an idea leading to an act has to be attended to, to the exclusion of ideas of other courses of action, and is so attended to, it is acted out because checks previously

existing are removed, and you feel the 'O. K.,' because that is a feeling which goes with unimpeded acceptance of an idea."

"You mean," said Mr. Henshaw, "that when we decide, for instance, to vote the Republican ticket, we really just attend to that idea, let it prevail in our minds, disregard conflicting ideas, such as to vote the Democratic ticket or not to vote at all. You mean that willing to do a thing is really attending to the idea of doing it, and that when we have done that much the idea will of itself lead to the appropriate act, just as you found when you watched your own acts; just as, to take another example, the idea of its being lunch-time makes me put on my hat and leave the office."

"That's it. Ideas tend to result in action if they have the chance. Letting them possess one's mind gives them the chance."

"That explanation seems to fit what I've noticed in myself in cases where I exerted my will, as we'd ordinarily say, to do something that went 'against the grain,'" said Miss Fairbanks. "I used to find it very hard to go through a certain sort of practice at the piano. The time for it was from two till four in the afternoon. Now, when the time came, ideas of going out for a walk, of sewing that needed to be done, of making a call, of finishing some book I was reading, etc., would come up, and of course, also, the idea of sitting down to the piano and going over those abominable exercises. Now, as I said, it took considerable will power to make me attend to business, and my act was, just as Arthur says, an act of attention.

If I could get and keep my mind on that piano-practice idea and shut out those other ideas, I would find myself thrumming away. The struggle was to keep that idea in the focus of my consciousness, and keep those other ideas from appearing on the scene. Willing to practice rather than make calls, etc., was for me exactly attending to the former idea and excluding others."

"That feeling of effort one has in willing is an interesting feeling," remarked Mrs. Elkin. "I suppose weak-willed people can't stand the strain of it."

"It's a lucky thing that it isn't a necessary accompaniment of all our decisions. We don't always have it."

"No; it's only in cases where we decide in contradiction to some inborn impulse or regular habit," said Miss Atwell. "I feel no effort in deciding to eat my meals, or to read an interesting story, or to lie in bed in the morning. It's when we decide in favor of some far-off consideration or some general principle that doesn't appeal to our appetites or habits that the feeling of effort enters. It's just like the same feeling in attending to other ideas than those of acts. One has no feeling of effort when he attends to a fire-engine, or the taste of his food, or attractive scenery, or charming music. It's when the object is not in line with our inborn or acquired tastes and interests that we feel effort in attending to it. I suppose that the acts of will which for people in general require most effort are moral acts. Now they are par excellence acts where one's personal, selfish appetites and inter-

ests are sacrificed for some general good, some universal principle."

"Besides this parallel between the feeling of effort or strain in attention in general and the same feeling in the attention involved in willing, we might make another," said Mr. Henshaw. "We found that improvement in attentiveness meant (1) improvement in ability to stand the strain of inhibiting other ideas and impulses, and also (2) learning to attend to the right things. So improvement of our wills means increased ability to stand the painful feeling of effort and also the habit of welcoming ideas of the right acts; for example, attending or being possessed by the idea of working rather than that of dawdling. After a while a man may will the right acts without effort. The far-off moral considerations may by proper education come to take the chief place of their own accord. One may come to really be more inclined to study than to play. So much the better for him if he does. If one can will the right things without effort, without sacrifice, he's all the better off."

"I think," said Arthur, "that we've now a fairly clear idea of what we mean by people's wills, and also of the many things we do without willing them. But if there is anything more to be said, let's have it. I might add that our study of attention and voluntary purposive thinking, and also of willing, has made it clear to me that *not* thinking certain things, *not* doing certain things, *inhibiting*, as we've come to call it, is about as important a part of human nature, of mental life, as positive thinking or doing. What we neglect seems as important as what we select, and success in

life seems due as much to leaving things out as to putting them in. Attention to one idea is largely inhibition of others. Reasoning is largely neglecting unessentials. Willing is largely rejecting certain ideas, motives and impulses. To adopt an Hibernian mode of expression, 'What we are is largely what we are not!' Are there any other remarks?"

"You remind me," said Miss Clark, "of an observation which I dropped into the box long ago. May I look it up and read it to you? Here it is:

" 'A lady of a very nervous organization would frequently, while at table, spend ten minutes deciding whether or not to eat oatmeal (or some such simple question). She would alternately think of reasons for and against the act, and would frequently be unable to act at all, until by diverting her attention from the matter altogether one impulse was allowed to prevail. In all sorts of things where her decision one way or the other was really of no consequence she seemed to have no power to make up her mind. If she started to decide one way, something would come up in her mind which would make her take back her decision.' "

"This lady, I suppose, had too much, or rather, misplaced, inhibition. Whenever she thought of doing anything, some other idea would come up which would work against the thought."

"Yes," said Dr. Leighton; "her will was diseased in that any one idea aroused a lot of contradictory, inhibiting ideas, and her attention vacillated among them, not letting any one idea hold the field long enough to work out in action. I gave you a case of the exactly opposite tendency earlier in the evening,

that of the man who had to go down to lock the door nights. In his case, not the inhibiting ideas, but the impelling ones, were too strong. His attention was too firmly possessed by a single idea."

"Let's adjourn before we get too deep into the unhealthy side of human nature," said Mrs. Ralston. "You can talk that over by yourselves."

NOTES BY THE EDITOR.

Human conduct is, as the club found, a complex matter. (1) We do some things because we are made so that a certain situation calls forth a certain act; we do others (2) by accident; others (3) by force of imitation; others (4) because any idea which has in the past led to a certain act tends, when again present, to lead to that same act. Finally (5) we may, by controlling our ideas by attention, voluntarily choose certain acts —that is, will them.

Willing a thing thus means attending to the idea of doing it. The effort of will is the effort of attention. Diseases or weaknesses of will are instances of defective impulsion or defective inhibition. The man with the healthy will is the man in whom natural impulses are strong but under control, and in whom inhibition is not excessive or misplaced.

CHAPTER XII

HABIT AND CHARACTER

"In discussing the will and its influence on our conduct I think we left out one rather important matter," said Mr. Tasker, as soon as the club was called to order. "After an act or a series of acts has been done several times as a result of willing it, it tends to become habitual, to be done without much thought, as a matter of course. To put the thing exactly, any acts or series of acts which *have been* done in a given situation tend to be done again when the same situation recurs."

"But that isn't true," was the quick response from Miss Atwell. "Suppose I face the situation, 'sight of a new fruit,' and my act is to take and eat it. Suppose it tastes very nasty. Now let me next day be in that same situation. Will I take and eat the fruit? Not at all. For the previous result was disagreeable. Only when the result of the act is pleasurable or indifferent is a habit formed."

"I'll accept that amendment," said Mr. Tasker. "I remember now that we made that distinction at one of our first meetings. But you must agree to amend *it* by saying that often if one *does* repeat the act many times, its result may come to be pleasurable. For instance, eating olives does."

"There's another modification needed," said Arthur. "A pleasurable thing too often repeated may

become disagreeable; for instance, the same kind of food or the same walk."

"Are there any more modifications?" said Mr. Tasker. "If there aren't, I'll go on. We form habits of acting, and such habits grow stronger and stronger with each repetition—that is, certain movements become surer and surer to be made in certain situations. As we saw in our first meetings, this represents the formation of closer and closer connections between nerve-cells aroused to action by the outside situation and nerve-cells whose action brings about the movements in question. Now, as any series of acts thus become habitual, there is less and less need of our willing them, attending to them, or even thinking about them at all. We may carry them out without consciousness—that is, automatically. Thus our wills are freed from the care of a big percentage of our activities."

"You could say, too, couldn't you," said Mr. Henshaw, "that the fact that every decision, every act of will, left a permanent effect on a man in the shape of so much bias toward some habit, made our decisions, our acts of will, all the more important. Last time we rather tended to belittle the importance of our wills, because we became interested in seeing how many things we did without willing to do them. But many of those acts were acts which *at the start we did will.* In many cases we *did* have to attend to them and think about them *once* in order that *later* they might become habits and run off automatically."

"Yes. Every act or thought, not only those resulting from deliberation, but also from chance,

impulse, imitation or what not, leaves a trace, prepares the way for others like it. We may forget it, and our friends and foes may, but its influence has been felt. Dr. Leighton says our brains are affected by every activity in them, that their growth depends on the sort of work they do, and that they register a man's good and bad deeds as faithfully as the recording angel."

"To come back to your point, that the growth of a lot of fixed habits leaves one's will and attention free to attend to other matters," said Miss Fairbanks; "you can see how important and helpful that is by taking piano-playing as an illustration. At first you have to think where to put your fingers for each note, but you soon form the habit of hitting the right key when you see the note. The sight of the score brings the right movement to pass automatically, and you are free to attend to combining certain movements so as to play chords, etc. The associations between the sight of certain combinations of notes and the proper movements involved in playing them soon become habitual, and you can think of something more advanced. After a while the mere playing of ordinary pieces becomes automatic, and you devote your mental efforts to getting improved tone and expression, etc. One could never get very far on in music if the brain didn't look after a great many things without help from our thinking powers."

"Imagine," said Mrs. Elkin, "what life would be like if we had always to think about things the way we do at the start—if, for instance, when eating, we had to think about our knives and forks the way four-year-olds do. There couldn't be much table-talk."

"It strikes me," said Mr. Henshaw, "that forming habits is like acquiring capital. A person who always has to think out each simple act would be like a man who lives from hand to mouth, who never can advance his position in life because he has always to think about that day's bread. The man who forms habits, on the contrary, is storing up a great deal of useful ability; he doesn't have to work all the time for the present day's needs, for he can draw on his capital, these habits, to supply many of his wants, and so be free to make wide plans and to foresee the future. Moreover, just as capital begets capital, so one habit serves as a basis for others. Harmful habits might be likened to debts, to complete the simile."

"Important as habit-forming is at all times, it is especially so for young folks," said Mrs. Ralston. "I wish I might have known what I've heard to-night when I was fifteen years old. I didn't realize then that the habits I was forming would decide what I'd be all my life long. Ordinarily, after people are twenty-five they don't change their general habits of thought and conduct. It's about as hard as to add a cubit to one's stature."

The club now engaged in some general conversation concerning the moral importance of habits, in place of which the editor prefers to insert a quotation from Professor James:[1]

"The physiological study of mental conditions is thus the most powerful ally of hortatory ethics. The hell to be endured hereafter, of which theology tells is no worse than the hell we make for ourselves in

[1] "Principles of Psychology," Vol. I, p. 127.

this world by habitually fashioning our characters in the wrong way. Could the young but realize how soon they will become mere walking bundles of habits, they would give more heed to their conduct while in the plastic state. We are spinning our own fates, good or evil, and never to be undone. Every smallest stroke of virtue or of vice leaves its never so little scar. The drunken Rip Van Winkle, in Jefferson's play, excuses himself for every fresh dereliction by saying, 'I won't count this time!' Well, he may not count it, and a kind heaven may not count it; but it is being counted none the less. Down among his nerve-cells and fibers the molecules are counting it, registering and storing it up to be used against him when the next temptation comes. Nothing we ever do is in strict literalness wiped out. Of course this has its good side as well as its bad one. As we become permanent drunkards by so many separate drinks, so we become saints in the moral, and authorities and experts in the practical and scientific spheres, by so many separate acts and hours of work. Let no youth have any anxiety about the upshot of his education, whatever the line of it may be. If he keep faithfully busy each hour of the working-day, he may safely leave the final result to itself. He can with perfect certainty count on waking up some fine morning to find himself one of the competent ones of his generation in whatever pursuit he may have singled out."

"I wonder whether it would be too much to say that a man's *character* is really just the sum total of his habits of thought and action?" said Mr. Elkin. "Peo-

ple are all the time talking about good characters and bad characters and so on, and a few weeks ago I put into the box the question, 'What really is a person's character?' Our talk about habits seems to give at least a partial answer.'

"It seems to me," replied Mr. Henshaw, "that when we say any one has such and such a character we don't mean that he has any *thing* in him which corresponds to the word. We really mean to express briefly the history of his behavior and to make a prophecy concerning his future. If we say, 'John Smith has an upright character,' we mean that in general his actions have been and will be upright, not that there is any extract of uprightness inside of his mind. Character means the way that a man has reacted and will react to the situations he meets in life. Of course his habits denote a lot of particular ways of acting, and the sum total of them will be a large part of his character."

"But mustn't there be *something* in him to cause these actions, something which is the basis of his behavior?" said Miss Clark.

"Certainly. The connections formed in his brain would be the cause, in this sense, of his behavior, and the difference between two men of different characters would be that in their brains there were different cell connections. I meant that there was no one *object* or *thing* corresponding to character."

"Can't we see a little more closely what the basis of character is?" said Arthur. "What you say would be true of a man's whole nature or make-up, and if you mean to refer to that when you use the word

character, all right. Then our whole study has been of the elements of character. Instincts, habits, sense powers, etc., all have a share. But suppose that we take as our meaning for character the *permanent general trend of a man's mind*, as opposed to the occasional, accidental and inconsistent in his life. That, I take it, is what we often do mean. For instance, we say that so and so acted *contrary* to his general character, or though he was of a good moral character he committed one great crime, or this one act of heroism is the bright spot on a cowardly and base character. We oppose a man's general character to his particular acts. Any one of them may or may not be in accord with it. According to Henshaw's account, such talk would be bosh, for a man's character, he says, is the sum of *all* his tendencies to action, and so we couldn't ever act contrary to our characters. Of course, one is at liberty to take any meaning for the word, but I'd rather hear you discuss the sort of thing I've described."

"I'm in favor of that myself," replied Mr. Henshaw. "It will be a more definite topic. I suppose a man's habits would still be a part of his character in this sense."

"Yes; they are among the stable, permanent factors that determine his behavior."

"Another thing would be his general temperament, would it not?" said Miss Atwell. "Some people, like Mrs. Slocum, are chronically pensive and sentimental, though of course on occasions they may become different. Others, like Mr. Ripley, are generally sanguine and hopeful, and take things vigorously. Others are

generally slow and dull and apathetic. Some people's minds seem to move quickly, others slowly; some to feel things deeply, to take ideas or feelings hard, so to speak, others to be little impressed by things. I should think that all these differences of temperament, of general mental action and general emotional tone, were factors in the character of any one."

"We mustn't forget a man's stock of ideas and conceptions," said Mr. Tasker. "If we leave out of account the chance ideas and opinions that vary from week to week, and think of the permanent store of ideas which a man keeps unchanged through a long period of his life, we shall have to agree that they help to determine the general aspects of a man's conduct. A man's religious creed, his political opinions, his ideas about life and work and money and study and friendship and love—in fact, his entire circle of thought upon important subjects—all are parts of this permanent background of his nature which we call his character."

"His habits, his emotional temperament, his general mode of mental action, his circle of thoughts—that is a pretty fair analysis of a man's character," said Mr. Elkin.

"Yet you've forgotten one important factor, I think," said his wife, "the man's *ideals*. We are not only what we have and what we have done, but also what we wish to be and do. A man's standards of conduct, his aims in life, the intellectual nature which he admires, to which he tries to attain, are a part of him. You might include these ideals of honor, duty, truth and love among his ideas, but at

least we should remember that they are ideas of a special sort, and are of special importance in estimating his character. His habits, temperament, mode of mental action, permanent conceptions, *and his ideals*—these together are a man's character."

"Happy the man who has a large store of useful habits of thought and action, who is of a cheerful, matter-of-fact temperament, whose mind works steadily and fast and with a broad field of consciousness, who is furnished with a large stock of sensible opinions and cherishes sane and noble ideals."

"A very good speech, Henshaw; but I don't see just how one can acquire some of these elements of a first-rate character. We've seen what habits are due to, how a man's ideas and ideals come, but I'm not sure about his temperament and about such general characteristics as quick and slow thinking, intense and shallow, broad and narrow fields of consciousness."

"I don't myself know just what those are due to, or how they can be acquired, or how far their acquisition is under our control. Does any one?"

"We'll have to leave those questions open. At any rate, we've done a good thing in clearing up a vague fact—character—and showing the different familiar elements which really compose it. We can see now what we mean by character changing. New habits, new ideas and ideals, modifications of temperament and mode of mental action would all change character. We can see what we mean when we say, 'His righteous character kept him from giving way to a natural impulse to revenge.' We mean, of course,

that fixed habits of tolerance, ideas of the folly of retaliation, and a well-balanced temperament inhibited the temporary impulse. We can interpret such words as fickle, pig-headed, pliable, etc., when applied to character."

"Yes. I think we'd better be satisfied with the evening's work, and adjourn."

CHAPTER XIII

SUGGESTION

"I suppose that our first business to-night will naturally be to talk over the exhibition of hypnotism which most of us attended and which Mr. Henshaw took part in as a subject. What observations about the state of hypnosis did you make while you yourself were in that state, Mr. Henshaw?"

"I don't know. I forgot all that happened during the time I was hypnotized as soon as the operator woke me. I shouldn't know a thing that I'd said or done unless people had told me about it. My only observation, therefore, must be that when some people are hypnotized, they lose, on leaving the state of hypnosis, all memories of what occurred therein."

"That isn't true of all people, for Fred Davenport told me that he did remember what he had done."

"Quite so. I probably went into a much deeper hypnotic trance than Fred, for I've had experience with hypnosis before. When I was a reporter in New York years ago I had occasion to be hypnotized a number of times. If one goes into only a very light hypnotic sleep, he may remember."

"What do you suppose makes that forgetfulness?" asked Miss Atwell.

"It seems to me that it's something like our forgetfulness of our dreams. There aren't any connections between our ordinary waking life and either our

dream experiences or our experiences while hypnotized. The two systems of thought are widely separated, dissociated, and so one doesn't call up the other. Experiences of one trance may be called up in another trance. I'm rather interested in these exhibitions, and I went three nights. My office boy had been hypnotized Monday night, and on Tuesday morning couldn't tell me a fourth of the things he'd done. I asked the operator to hypnotize him Wednesday, and tell him to remember what he'd done Monday night. He did so, and the boy when hypnotized remembered nearly everything. The important thing shown by this forgetfulness is that the thoughts and acts of deeply entranced subjects are cut off from their ordinary mental life, form a separate system."

"That may all be," said Mr. Elkin; "but how in the world can a sane man like Judge Rodney be induced to hug a broomstick, and go around on all fours barking, no matter what system he's in?"

"I don't suppose," said Arthur, "that any one can say just how he is induced with surety, but it strikes me that this dissociation from one's ordinary thoughts would give us a clue. In dreams we are dogs, or soldiers, or millionaires, and act as such because somehow the idea that we are starts up, *and the ordinary course of ideas which would naturally come up and show us the folly of such a notion is not in running order.* We saw in thinking about the will that every idea tended to be believed in and to work itself out in action if it wasn't prevented. Ordinarily a false idea—*e. g.*, that I am Napoleon—is at once denied belief or motor effects by other ideas which

are called up, such as, 'But your name is Ralston,' 'But you live in 1900,' 'But you are five feet eleven,' 'But you aren't Napoleon,' etc. But suppose a man's brain to be so affected in the hypnotic trance that ordinary associates don't come up, that only those associated ideas come up at any time which are in harmony with the operator's suggestions. Why shouldn't he bark when the idea of being a dog is put into his head? Why shouldn't he strut and be pompous when told that he is the emperor of Germany?"

"But why," said Miss Fairbanks, "does he receive such ideas? Why does hypnosis make a man so suggestible, so ready to take any idea from the operator?"

"I don't know," said Arthur. "Do you, Henshaw?"

"I don't know that any one does," was the reply. "We can simply see that in this half-awake, half-asleep condition that we call the hypnotic trance any one is an easy victim to suggestion. We can see that he *does* realize the ideas presented by the operator, and we can suppose that he does *not* realize, at least not emphatically, the contradictory ideas which in a normal condition he would. I should say that the essential of the hypnotic condition was suggestibility, uncritical acceptance of ideas, but why that is so is beyond us. The case is the same with sleep. Why should a man, just because he is in the sleeping state, believe in all sorts of absurd things, lack his customary, criticising ideas? The latter state is so common that we don't marvel at it, but if it happened only once or twice in a lifetime, we'd doubtless puzzle over it, much as we do over hypnotism."

"It is wonderful, isn't it," said Mrs. Elkin, "to what lengths the power of the operator's suggestions may go. Do you remember how he made that woman drink vinegar by calling it soda-water? She smacked her lips over it, too. Her very sensations were modified."

"Yes," added Miss Fairbanks; "and he could abolish sensations as well as modify them. She let him stick a needle right through her tongue, and apparently didn't feel it at all."

"Of course you folks know," said Dr. Leighton, "that people have had all sorts of operations performed upon them while hypnotized. Arms have been amputated, teeth extracted, children born, without the least pain. In fact, the medical profession was just taking up hypnotism as a method of anæsthetizing people when the discoveries of ether and chloroform provided anæsthesia in another way. Hypnotism is still used in certain cases."

"You shouldn't have kept still and let us show our ignorance, Dr. Leighton. Probably you know all about hypnotism."

"I think you've got at all that I could have said, and put it in a better way. As you've said, the hypnotic trance is first of all a condition of mind in which a person is extraordinarily suggestible. Any idea or hint given him is accepted. You say, 'You are a soldier,' and he marches in time, with shoulders back, salutes you, etc. His suggestibility makes him in many cases an easy victim of illusions and hallucinations. He will see a stick as a gun, or hear a series of screeches as a fine song, or will feel that he is

freezing or hungry or is a six-year-old child, all at your slightest suggestion. He will be unable to make movements which you suggest he cannot make, unable to feel pains which you suggest do not exist. In the second place, the hypnotic state seems, as you've said, to represent a system of ideas and behavior split off from a man's ordinary mental system. The events that take place in it tend to be forgotten, and there is evidence that the irrationality and subservience to suggestion are the results of this split-off, dissociated condition. There is no inhibition, no restraint, no criticism, because the ordinary associations of ideas and ordinary habits of action don't come into play."

"I've read of a hypnotized person who was able to hear a watch tick in the next room when no one else could, and of another who would read through the *back* of a book, the operator holding the book open and looking at the printed page. The way the subject did it was *to look at the tiny image of the page in the operator's eye.*[1] If these cases were true, it would show that in the hypnotic trance the senses may become extraordinarily acute."

"They doubtless do, Mr. Tasker. Your case is from a reputable book. The same man, it is said, could see with the naked eye things which in his ordinary state he couldn't see at all without a microscope."

"After all, said Mr. Henshaw, "is this extreme susceptibility to suggestion such a very peculiar and isolated fact? Isn't it true that we are all the time doing things just from suggestion without any real reason?

[1]See James's "Psychology," Vol. II, p. 609.

When a political speaker controls, as we say, the minds of thousands of men, so that they vote or act as he desires, he often doesn't do it by argument or reasons, or by influencing their rational opinion, but just by persistently and adroitly suggesting certain ideas. When a skillful lawyer gets hold of a certain sort of witness, we know that he can make him say or deny almost anything. He does it, I believe, largely by using the force of suggestion. Take a mob of men who lynch a man or start a riot. They act from suggestion. I talked with one of the men in the mob of strikers at Lawrence who burned down the mill. He was a thoroughly decent fellow, and I wondered how he came to do such a thing, so I asked him. 'I don't really know,' he said; 'I just had to do it. The impulse got hold of me, I suppose, because the crowd was doing it. I didn't think why or why not, or of anything but just of burning that building down.' "

NOTE.—One of the most emphatic cases of the power of suggestion to make a man act contrary to his real nature and convictions is given by Dr. Sidis in his book entitled "The Psychology of Suggestion": "While Sokolov was fighting hard for his life, I saw a corporal lying on the piazza and crying bitterly. On my question, 'Why do you cry?' he pointed in the direction of the mob and exclaimed, 'Oh, they do not kill a commander, but a father!' I told him that instead of it he should rather go to Sokolov's aid. He rose at once and ran to the help of his commander. A little later when I came with a few soldiers to Sokolov's help, I found the same corporal striking Sokolov with a club. 'Wretch, what are you doing? Have you not told me he was to you like a father?' To which he answered, 'It is such a time, your honor; all the people strike him; why should I keep quiet?"—page 305.

"In schools," said Miss Atwell, "I've often seen teachers get answers from their scholars which they thought were the result of knowledge or interest, but which I could see were really the results of the teacher's own suggestions. For instance, a teacher says, 'How many children think this poem is very beautiful?' and all the youngsters raise their hands, though they may in reality have been bored to death by it. As for the production of hallucinations, I've read of this experiment. A man brought to a schoolroom an atomizer full of water. He talked to the children about spring and violets, and how nicely they smelt, and then he went around spraying the water and asked the children what they smelt. A big percentage of them smelt violets very strongly, and were sure that the atomizer had perfumery in it."

"I think that often our feelings toward paintings and poems and artistic things are really due to suggestion, not to real reasons. We enjoy and admire those things which we expect to enjoy and admire. Do you remember the story of John Kendrick Bangs' 'Idiot,' who told the people at his boarding-house that he had written a sonnet, and repeated one of Shakspere's to them. They all felt it to be trash, and ridiculed him unmercifully. If he'd started out by saying, 'You all probably admire that famous sonnet by Shakspere,' I dare say he could have repeated some perfect bosh and still held them enthralled."

"It seems perfectly clear that suggestion plays a great rôle outside of the hypnotic state, but I suppose we'd all agree that in the hypnotic state one's susceptibility to suggestion is vastly increased."

"And the manner of the suggestion is likely to be very different in the two cases, isn't it?" said Mr. Henshaw. "If the striker I mentioned had been hypnotized, you could have said, 'Light this match; put it there,' and he would have obeyed your direct command, whereas actually the suggestion came in a rather subtle, indirect way. The cries of the mob against the owners, the insinuation of the leader that it would be a good thing if their old mill was destroyed, etc., gave the suggestion in a masked form. So with your children. Your man couldn't have come in, said nothing but 'Smell this; it's violet perfume,' and succeeded in producing the hallucination. He could have if the youngsters had been hypnotized. As it was, he had to mask his suggestion, make it indirectly. So with your sonnet. The Idiot couldn't have said, 'This poem is bad; you will detest it,' as one could to a hypnotized person. He made the suggestion that they would ridicule it by attributing it to himself. Suggestions to normal people seem to work best when they are masked or made indirectly, while they work with hypnotized people no matter how direct and barefaced they may be."

"I think," said Mr. Elkin, "that a man I used to work for had at least a practical knowledge of that fact. He wouldn't say, 'Do this,' or, 'You must get this done before dinner,' but he'd say, 'When you get those boxes all arranged, you come to me, say about eleven o'clock'; or, 'I'd like to have you do some copying for me after you get those boxes all nicely arranged. Come about eleven.' He would not command, but would suggest, would take it for granted

that I'd do that arranging as fast as I could, and the result used to be that I'd work like a beast at the job, whatever it was, because I didn't think of doing otherwise. If he'd ordered me to get the work done by eleven, I probably would have expected it to take a longer time, and wouldn't have worked so fast."

"I can assure you that suggestion, as you call it, is a necessary method with children," said Mrs. Ralston. "We all know that if you say to a child, 'Now I'm going away, and you must not go out of the yard; don't go near the brook, of all things,' you'll be likely when you come back to find the youngster all wet from paddling in that very brook. Your command acted as a suggestion to the very thing you wished to avoid. I remember, too, how well an indirect suggestion once worked with a five-year-old boy in a Sunday-school class. He was behaving very badly, and I made him sit beside me, where I was keeping him fairly quiet. To show off, he said: 'If I had a whip, I'd lick you; I'd lick you all to pieces. You're a fool,' and all such things. I said to the other children, 'Isn't it too bad that Harry isn't big enough to sit up by himself and keep still?' Immediately he spoke up: 'I guess I can sit still as well as anybody,' and he took his own seat, and was as quiet as a mouse for fifteen minutes. An ounce of suggestion is often worth a pound of commands or reproofs."

"We can suggest to ourselves, too," said Miss Fairbanks. "If I feel that I'm going to play well, if I say to myself, 'You have that piece well in hand; you'll do better to-night than ever before; you needn't have any fears about this concert,' I *will* do well. If,

on the contrary, some train of thought gets me to thinking about possible mistakes and failures, I'm likely to make them. Self-confidence might be called self-suggestion of success, I should think."

"It's interesting to see," said Mr. Tasker, "how an odd, abnormal aspect of human nature like the hypnotic trance leads us, when we study it, to a lot of information about everyday life. We've seen that it is directly due to the tendency of all ideas to command one's belief, and to result in appropriate movements unless they are counteracted by other ideas and habits. We've found suggestion to be at the bottom of many of the facts of mob nature, school life, home education, the witness-stand, literary appreciation, and self-confidence. I have a notion that suggestion may also account for two observations which Miss Clark put in the box weeks ago. Won't you read them to us, Miss Clark?"

Miss Clark read: "'I once went to see a 'healer' who had attracted large crowds. He had evidently made an impression on the public, for over a hundred people, some paralytic, some with goitres, some lame, were there. He was a very imposing man in appearance, and in the half hour's speech with which the performance began, his rich voice and confident manner almost made one believe what he said, though it was perfect trash. Finally he let twenty sick people come on the platform. He had been doing this each day for two weeks, so he couldn't have hired them to be confederates. It would have cost too much.

"'One case was very striking. A man had come up whose right hand was all contracted and bent. He

said he hadn't been able to open it for years. The healer said he would cure that all right. He rubbed the hand a moment or so, in the meantime talking soothingly about nerves and vital force and so on, and telling the man that he was getting his hand back to health. "Now," he said, "it's all right. The circulation is restored. Open it out so," and he took hold of the man's fingers and straightened his hand. "Open it yourself. Shut it. Open it. There you are, sir. That hand is as good as ever." The astonished man walked from the platform down the aisle of the hall, looking neither to the right nor to the left, but holding his eyes fixed on that hand which he held up and alternately opened and shut.'

"I won't read all of the other observation. It simply narrates one of the few Christian Science cures I've come across. It was a case of rheumatism."

"Well," said Mr. Henshaw, "if suggestion can make a needle in the tongue painless, or raise a blister, or make one's muscles all rigid so that one lies for twenty minutes with one's head on one chair and heels on another, I don't see why it may not be the explanation of the occasional successes of these Christian Scientists, mental healers, and crank doctors of all species. What do you think, Dr. Leighton?"

"I think suggestion *is* at the bottom of such cures," was the reply. "No matter whether the crank doctor talks of the spiritual nature of the universe, or the vibrations from the sun, or the supremacy of the mind, or the value of faith, or the virtues of his roots and herbs, or vital force, or magnetism, no matter whether

he gives you religious advice, or a tin can with a string tied to it, or a magic belt, or a rabbit's foot, or a message from the spirits, if he has any effect on you, it is probably by suggestion, by inoculating you with the idea that you are or will be well. The more intelligent men in the medical profession now grant that mere mental suggestion, in or out of the hypnotic trance, can often help to cure people of some afflictions, especially nervous troubles and what we call hysterical or mock diseases—where, for instance, the patient may be unable to see, though his eyes are all right, unable to move his arms, though his muscles and nerves are all sound. And it is even likely that it may be efficacious over a wider field than we now think. Of course, suggestion can't do everything. Cancer, Bright's disease, abscesses, tumors, yellow fever, the bubonic plague, and such like, need the doctor's drugs or the surgeon's knife. The cranks abuse it. And probably it is much more efficacious with some types of mind than with others. Still, it's a good thing to have on your side. And a magnetic, hopeful physician, who inspires confidence, will be likely to cure more people than one of the opposite type. We all know that. To make it the sole means of curing disease, however, is simply murder. If you care to hear accounts of some authentic cases where reputable physicians have by suggestion effected cures comparable to the supposed successes of the quacks, I'll run over to my office and get Bernheim's 'Suggestive Therapeutics.' "

While Dr. Leighton was gone, a number of stories

were told of cures and failures to cure by different sorts of quacks. He soon returned, and read the following accounts of some of Bernheim's cases:

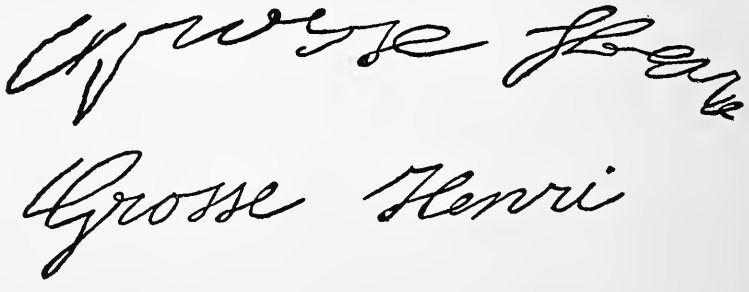
" '*Observation XXVIII.—Aphonia in a nervous woman, dating back eight days.—Immediate cure by hypnotic suggestion.*

" 'Madame O., who is fifty-five years old, is generally well. She says that every winter she has *hoarseness*, which lasts six weeks. At the present time, January 23, 1887, she has had *severe hoarseness for eight days*, without any cough or expectoration; she has an enlarged gland over the right ear and pain on the right side of the neck. . . . .

" 'I hypnotize her; in a few seconds she is in somnambulism [a deep trance]. I suggest the total disappearance of the aphonia; I make her talk in a loud voice. In a few minutes I wake her. To her great astonishment *her voice has come back.* She has remained cured of her aphonia.

" '*Observation L.—Trouble in writing, consecutive to chorea—Cure in a single seance of hypnotic suggestion.*' "

Dr. Leighton showed in the book copies of the boy's writing before and after suggestion had been used. The copies were about like these. The cure was permanent.



"'*Observation LXXXIV.—Arthralgia consecutive to an arthritis.—Immediate cure by suggestion.*

"'D., twenty-one years old, comes to consult me on April 2, 1884. Three months ago, after having wheeled a wheelbarrow, he developed a swelling of the left heel, and was unable to bend the joint. Six weeks ago a physician applied a starched bandage, keeping it on three weeks and two days. The bandage was taken off fifteen days ago, and there was no improvement.

"'D. limps and bends his knee when he walks. He cannot bend the left heel, which is painful to pressure. The swelling has disappeared. On the 2d I hypnotized him. Profound sleep; memory perfect upon waking. Suggestion and passive movement of the joint during sleep.

"'Upon waking, he bends the tibio-tarsal articulation very well and spontaneously without pain. He walks well, ... the cure has been maintained.'

"For the last one," said Dr. Leighton, "I'll read you a case something like Miss Clark's man at the healer's.

"'*Observation LXXX.—Rheumatic paralysis of the forearm and right hand. . . . . Total cure in four sittings.*'

(In the first two sittings the patient regained ability to straighten his wrist, to lift his hand, and to feel heat, cold, touches, etc., on its surface. Now follows Dr. Bernheim's account of the influence of the last two sittings.)

"'Dr. Levy sent the patient to my clinic on June 30. . . . . *The middle, fourth, and little fingers are*

bent into the palm of the hand at an angle of one hundred and twenty degrees. . . . . After two hypnotic seances, the patient *opens his hand easily*. . . . . The cure is complete.' ''

"Before we go, Doctor," said Arthur, "what book would you recommend on this subject?"

"On the whole, I should say that 'Hypnotism,' by Albert Moll, would be the best. The chapter on hypnotism in Volume II of James's 'Principles of Psychology' would be a good chapter to read with it."

CHAPTER XIV

IMITATION

"I find among the observations," said Miss Fairbanks, at the beginning of the meeting, "a number of statements pointing to imitativeness as a common feature of human nature. Mr. Tasker mentions a spring during the time he was at college when four men out of every six in the college wore corduroy trousers, for no special reason that could be discovered. Miss Atwell has some comments on the way styles in women's dress are taken up. Mr. Henshaw has noted that one war play, like 'Shenandoah,' seems to bring forth a number of successors. The fad for pictorial and inscribed buttons is a recent case that I have noticed. Most of our styles and fads are not due to real desires, but to a human tendency to follow a leader, to do the thing done. If the club has no objection, I'd like to have you talk over imitation as it is found among men and women."

"The topic seems to me very timely," said Mr. Tasker; "for, after all, isn't most of this imitation really suggestion over again? When a person sets the example to others and is followed, what does he do but inoculate them with the idea of doing or being that thing? The example spreads in the way it does because the suggestion is masked. If a college boy bought a pair of corduroy trousers, and then went around saying to every one, 'You want to get some

of these; they're fine; get a pair; please get a pair,' the chances are that he wouldn't be imitated; but as things are, the suggestion is insidious, and the striking idea of that novel apparel comes to possess the minds of the whole college. Imitation of the sort displayed in those observations seems to me to be just suggestion."

"I suppose we'd all agree," said Arthur, "that there was no mysterious force, *imitation*, which compelled people to act as they do in these cases. Of course, the effect is produced by people being 'inoculated with ideas,' to use the phrase we seem to have adopted. But I don't think we ought to stop with labeling the facts *suggestion*. How does the suggestion work? Why do we imitate some people and not others? How do these fads, etc., start? Can you tell beforehand what will and what won't be imitated?"

"Your second question interests me," said Miss Atwell. "I used to think that we imitated solely the people we admired, looked up to, but I'm not so sure of it now. I think that we *tend* to imitate *everything*, because we tend to act out all the ideas we get. And I'm sure we often imitate people whom we don't look up to at all. For instance, I found myself catching the mannerisms of a teacher whose methods I hold in very low esteem."

"There is, however, a great deal of evidence in favor of your old opinion, isn't there?" said Mrs. Elkin. "Servants ape their masters' dress and ways; courtiers mimic their king. After all, we look up rather than down to find our models."

"Might it not be this way," said Mr. Henshaw.

"Suppose we accept what Miss Atwell says about the general tendency to do what we see done, to follow any one who goes, to become what any one is. There would then be a tendency to imitate most what we attended to most, and that would be likely to be the acts of those we admired. Also there would be a tendency on our part to inhibit imitation in the case of people beneath us morally or socially. We would feel, 'But I am not to be like that person.' In the case of those whom we feel to be above us, on the other hand, our natural imitativeness would be reinforced by a conscious effort to emulate. So, though when off our guard we might imitate anybody, as Miss Atwell says, the preponderance would be decidedly toward imitating our betters—that is, those we think of as our betters."

"It strikes me," said Arthur, "that we often adopt ideas not because we find them in our betters, but because their source is mysterious, unknown. If a woman *knew* the Hebrew manufacturer who invents some new style of hat, she'd never buy and wear that style of hat. But when the hat appears in the store window as a new style, her very ignorance of its origin renders imitation likely. I think that in many cases the fact that the suggestion comes from nowhere, that we don't know any reason why we should do a thing, that there is no sense in it, no model to esteem or disdain, favors imitation."

"That may be," said Mr. Tasker. "At all events, in most things we are imitators, following blindly the lead of some known model or some mysterious tendency. We like to be like other people, that is one

reason. Besides, most of us can't indulge in the luxury of inventing or thinking out styles and manners and opinions, etc., for ourselves. We take them ready-made, and save time."

"Somebody has to invent these things, though; somebody has to be the leader," said Mrs. Ralston.

"Each one of us is, I suppose, a little of both. In some things we lead, in others follow; but some people are leaders to a much greater extent than others. Henshaw is the leader, the inventor, the suggester, for the Republican party in this town; the rest of us are in politics his followers, imitators, suggestible subjects. We rehash his editorials in our conversation, originating perhaps some modifications of our own."

"And I," said Mr. Henshaw, "largely repeat the ideas of the big editors and statesmen, inventing here and there an idea, perhaps once a year. The real originators are few and far between. Luckily, their inventions, though hard to originate, are easy to copy. Progress would be inconceivably slow if we had to wait for each individual to invent every reform or new idea or new method for himself. It's well for us that inventions, new ideas, are like the plague or smallpox; they can spread by infection."

"You might add," said Mr. Elkin, "that as in the case of infectious diseases, some people have great power of resisting the germs."

"We have been gradually broadening our use of the word imitation until we've brought it to mean the source of all our acquisitions save those resulting from accident or absolutely original invention," said Miss

Atwell. "We mustn't forget that we are not talking about exactly the same process as we were when we started. It's interesting, however, to see that you can express the entire process of civilization by two facts, invention and imitation."

"It may be interesting," said Arthur, "but I think it's too vague to be profitable. It's easy enough to say that everything in people must be either the result of their own mental activities or the repetition of other people's, and it's easy to call the former invention and the latter imitation, but what of it? What good does such talk do if we don't see in concrete detail how this imitation occurs? When you start to make sweeping statements about the world at large, and to tack names to processes you don't understand, I feel like calling the club to order."

"We accept your rebuke, Arthur," replied Mr. Tasker; "and I'll leave our flight into speculation about civilization and return to definite facts by reporting an observation of mine to the effect that whereas the object of girls' imitation is generally distinguished for good looks, the boy who is imitated by other boys rarely is. In other respects the imitation of girls differs from that among boys."

"Oh, Mr. Henshaw!" cried Miss Clark; "that reminds me that you've never told us your opinions about the human nature of women, how their minds differ from men's, and that sort of thing. Won't you now?"

"I think I'd better not interrupt our investigation of imitation."

"I wouldn't mind that, Henshaw," said Mr.

Tasker. "I think human imitation is too complex a matter for us to see far into. We've noted its common occurrence, the sort of person imitated, and have all doubtless thought of the added importance given to our conduct by the fact that it is a germ that spreads to other people. I don't think we need dwell on the topic longer."

"Well," said Mr. Henshaw, "first of all, women seem to me to be decidedly different from men in their mental abilities. They are naturally less independent and aggressive, more docile and obedient."

"I don't believe they are naturally so," said Mrs. Elkin. "I think it's all due to their training. The little girl is not left to her own devices so much; she is taught to pay more regard to conventional opinion. It is not thought to be *nice* if she shows independence of spirit or mind. Originality isn't fostered in her as it is in the boy. People say women never reason, but when that's the case it's because they haven't been given the chance to. It doesn't pay for them to. They would be reasonable if people wanted them to be. The trouble is that all people expect of a girl is that she shall be agreeable."

The discussion of the mental differences between men and women became very lively, and the editor finds more rash statements and warmth of argument than real observations of human nature. Mr. Henshaw had little chance to report his opinions, and what he did say seemed to be only opinion, not observed fact. Indeed, at the end of the discussion Arthur wisely remarked that the club had gone beyond

their depth in trying to handle such vague questions as imitation or the psychology of the sexes.

Before adjournment, Mr. Henshaw asked the club to be ready at the next meeting to present facts about mental training, general development of mental ability.

CHAPTER XV

MENTAL TRAINING

"I announced last time that I wanted to have the club think over the question of how people can improve their intellectual powers, how they can train their minds. Arthur has been experimenting with the matter in a modest way, and later we'll hear from him. From our study so far 'the mind' seems to be just a name for the fact that we have thoughts and feelings, and what 'the mind' can do seems to be just to have certain particular thoughts on the proper occasions. The quality of a person's mind seems to depend on the particular ideas it has. We've found that there was no 'power of memory,' but really thousands of memor*ies;* that there was no 'power of attention,' but only superior clearness and prominence of certain thoughts; that 'reason' was just a name for the fact that certain ideas were dwelt on and others inhibited. What do all you school-teachers mean, Tasker, when you talk about training discrimination, training memory, cultivating the power of reason, etc.?

"I suppose some of them do mean that there are some mysterious forces, or mental dynamos, each of which does some one kind of thing, remember, or reason, or what not, and that education somehow gets these wonderful engines going and keeps their wheels greased. I remember once hearing a man at a teachers' institute compare the mind to a big machine.

'Sensations are thrown into the hopper at one end,' he said, 'attention makes them clear and intense, perception, imagination and memory in turn work them over. They are changed into general notions by the action of conception, and are then subjected to the influence of the reason, which turns out the finished product.' Of course, that sort of a view is all bosh.''

''But I don't see the impossibility of training apart from learning particular things. What we mean by greater mental power, by greater power of discrimination, for instance, is that all discriminative acts are more delicate. What we mean by saying that one person has more reasoning power than another, is that his reasonings in all sorts of lines will be more successful. If you don't like the word 'power,' take the words 'general ability.' If a person's general ability is improved, it seems to me fair to say that you've trained his mind.''

''May I put Henshaw's question in another way? Let's ask, 'Does special training give general ability?' As Henshaw says, our nervous systems seem to be schemes for associating particular acts with particular situations, particular ideas with other ideas. We can see how studying arithmetic makes a boy able to reason with numbers, for the study has given him the system of particular associations needed. Henshaw's point, I take it, is that there's no reason why those particular associations should make him any better able to reason about religious creeds. Training in arithmetic surely gives special ability, but does it give *general* ability? Wouldn't you, to be trained to really general reasoning, have to reason about all sorts of

things? That's really your problem, isn't it, Henshaw?"

"Yes. It seems to me that learning one thing makes you able to do that thing, but doesn't add to any general mental capacity."

"But if that were so, how could people vary so much in their abilities to handle novel problems in life? Some people surely do have better judgment than others in all sorts of matters for which they've received no special preparation. Surely, Mr. Tasker could do better, say on a North Pole expedition, or in a Chinese meeting, than Mike Malloy, who shovels off our walks. If we look back on our training at school and outside, we can see clearly that besides learning how to meet a lot of particular situations, we've become better fitted to handle all sorts of unfamiliar ones."

"I might claim, Miss Atwell," retorted Henshaw, "that our inherited capacities had something to do with such differences in people. We may have been born with a better general equipment than Mike. Look at the other side of the matter a bit. We learned that by training, by practice, some people improved vastly their delicacy in discriminating pitch, or the tastes of teas, or the colors of ribbons. But do you imagine that the musician who has had this training can discriminate the flavors of soups any better than average people, or that our tea-taster has any finer eye for color, or that the girl at the ribbon counter has, by her training, improved her ability to judge the lengths of lines? Take another case. Playing chess undoubtedly requires a lot of intellectua.

ability, but are the famous chess-players notorious for ability to think out any other life problems than those of chess? Tending a machine requires a lot of attention. A man running a complex machine often has to watch with the utmost care, but is he thereby enabled to attend to sermons or books or to a game of cards any better? Take a proof-reader. He exercises himself in observing small details hours every day for years, but he isn't any more proficient in observing plants or animals or human nature than before. Why, just take ourselves as cases. We've improved in observing and explaining people's actions about two hundred per cent, but is there any one here who observes the coming of the birds, or the condition of the weather, or the dust on the mantelpiece, any better than before?

"This is a good place to work in my experiment, I guess. Henshaw and I were talking about this after the meeting two weeks ago, and I thought of a scheme. I took twenty big cards and made on each a line. Those lines were from six to twelve inches long, and varied by half inches. I had mother and the Elkins and Arthur look at them, one at a time, and judge their length. Then I made another set of thirty cards with a line on each, but in this set the lines were ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜, and 1½ inches long. I then had the folks judge these, and record their judgments. I then had them do it over and over again, looking after each trial, so that they could learn to do it better. They improved tremendously, made, in fact, after a day or so, only about one-third as many mistakes as they did at first.

I then had them try the six to twelve inch lines again, and they did not judge them a bit better than at first. This is, of course, only a little thing, and wouldn't be anything to found a general opinion on; but so far as it goes it shows that training in one special field needn't improve us except in that special field."

"I'll agree," said Mr. Tasker, "that there isn't any subtle, mysterious training of '*the* attention' or '*the* memory' or '*the* reason,' for I don't think there are any such things to be trained, and I'll allow that your facts clearly show that special training *need* not give general ability. But still I don't see how you explain Miss Atwell's facts that a man who has learned to do a number of things accurately, thoroughly, and reasonably, will generally do unfamiliar things better, too."

"Would you claim that learning one thing didn't help us to know other different things *at all*, Mr. Henshaw, or only that there never was this mysterious general 'mental training' we hear talk about?"

"I meant only the latter," Mrs. Elkin; "but I'd like to see just how the special training could improve general ability before I believed it did in any case. I for my part will agree that we all have powers over a wider field than that in which we've actually developed them. I'll agree, for example, that having to bring up coal when you are a boy makes you more likely to be able to stand work in all sorts of lines. I'll agree that denying yourself cigars helps give a general power of self-denial. I should think any one who had pupils or children would want to know just how such general influence came about, as gen-

eral habits and powers seem more important in a way than particular accomplishments or information."

"I can see one way," said Mr. Elkin, "if you'll permit me to join this debate. There are some *particular* accomplishments which have *general* value. Bringing up coal, for instance, teaches a boy, first of all, that tasks which are unpleasant *can* be done, that disagreeable matters can be undergone. Now I take it that that is one of the most generally valuable bits of experience a boy can have; it may be a big part of the difference between a spoiled child and a decent citizen. Again, making a boy obey may teach him the particular but yet widely applicable truth that his own wishes are not the measure of the universe. So with industry. The habit of working ten hours a day may be acquired in connection with some special work—studying, farming, carpentering, or what not; but it is of general influence, for the habit is not 'If carpentering, carpenter ten hours a day,' but 'If working, work ten hours a day.' To use an Irish bull, 'Some special training is general.'"

"That's good; and I can follow it up by another shot. A man told me once that high-school geometry had been great training for him, for it taught him that things could be absolutely proved. Now his reasoning in geometry may have improved his reasonings about all sorts of things later, by giving him the idea that you can do more than guess at or follow opinions about any question; you can in many cases absolutely settle it. That idea may have been called up in all sorts of circumstances, and may have made him try to really demonstrate that a thing was so,

whereas if he had not studied the geometry, he might never have even tried."

"That might be the case with observation, too. A boy in school might from a course in botany or natural history get (what, perhaps, he never had before) the notion that you can find out things by systematically and carefully watching. He might get this idea in connection with the study of a frog or bean-stalk, but then apply it to business or politics or the stock market. We saw in studying attention how ability to stand the strain of effort was of great general importance. So, from the particular habits and powers that, as Elkin says, are general, and from the generally applicable ideas which special training may inculcate, we should expect some general influence. Yet this doesn't require any subtle mental machinery, but only the ordinary mental laws that we've been working with."

"I have a theory," said Miss Atwell, "that fits pretty well here. I'm rather proud of it, and you must listen to it. It has always seemed to me that the world is, after all, not so very big. We don't really meet so very many new things. For what we call new things are often just new mixtures of old familiar elements. We don't do so very many new things, either. What we think of as a totally new action is often just a new combination of old familiar movements. For instance, this figure which I draw, we'd call new. We've never seen it before; yet it's elements are none of them new. So with my act in drawing it. It would be called new, yet the separate acts of which it was composed were all familiar to me.

Now, this view gives still another opportunity for special training to seem to give general ability. We learn in some sort of special training a number of things and find that we then do better a lot of novel things. But they may be only apparently novel. Their elements may be the same as the elements of the first set of things. Special mental training may

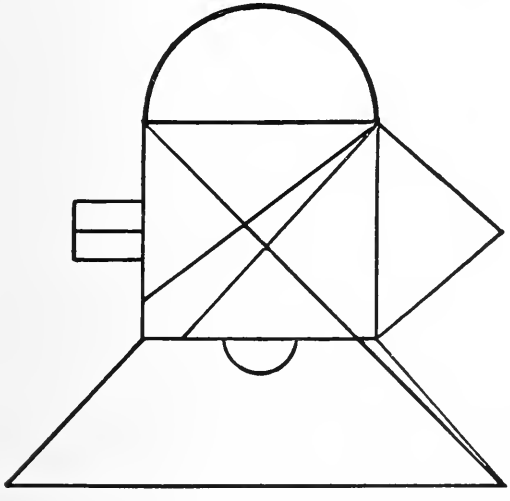


Fig. 12.

give general mental ability, then, in some cases, because the elements of the knowledge, the elements of the movements—the elements, that is, of the ability—were really the same in the general field."

"Let me give one more way," said Mr. Tasker. "The world is not only not so big as it seems, perhaps; it is also not so varied; very many things are much alike. Even where the elements of seemingly different things are not exactly the same, they may be near enough alike so that the treatment which

succeeds with one may succeed with another. For instance, practice in speaking before a class may make you better able to preach or argue in court."

"All that you folks have said I'll grant to be probable and to often occur, and I believe, as you do, that thus thinking or doing a thing not only teaches us that, but also fits us for other things to the limited extent you've claimed. But I think you ought to admit that we have no right to presuppose such widespread influence of special training until we have evidence that it exists. My experience is that every habit or power or bit of knowledge is often confined within a very narrow sphere of activity. People may be charitable in the church and niggardly in support of public institutions, observant of bugs and oblivious to human nature, reasonable about business and pigheaded in politics and religion, careful in speech and careless in dress, and so on through a list of a thousand things."

"I'm sure I'll agree to that, and I hope next year we can, under Arthur's guidance, test this question by making experiments to see just how far certain training improves our general powers," replied Mr. Tasker. "It certainly is foolish to talk about 'the faculty of observation,' or to suppose that because a man has learned to be accurate in one thing he will be in all others. I think that we ought all to recall what Henshaw said some weeks ago about each one of us being not so much 'a mind' as a multitude of 'mental systems.' I may be careful while in my 'school-teacher' system, and careless in my 'home life' system. I may be reasonable in my 'student of

physics' system, and utterly bigoted in my 'theology' system. I may have the innocence of the dove in my 'evening-party' system, and be as wise as a serpent in my 'business' system. The training of my mind in one of its systems need not pass over to any of the rest."

"Don't you think, too," said Mrs. Ralston, "that this ought to give us a good deal of charity toward people when they seem to us to be pretty mean and bad? We may see only one of their systems, and in others they may average up as well as most people. I don't think you ought to judge any one till you know the whole of him, all his *systems*, as Mr. Henshaw and you call them."

"I think," said Arthur, "that if all of us together should start in to know completely the human nature of just one single man, we'd be kept busy for all our lives, and at the end find many things in the man that we hadn't touched."

"I think," said Miss Clark, "that we must go home early to-night, and leave you to finish by yourselves. Good night, Mrs. Ralston, good night."

NOTES BY THE EDITOR.

The importance of this discussion for those interested in education either in the school or in the home is evident. There is a popular belief that attending to, or observing, or reasoning about one sort of things makes one attentive to, or observant of, or reasonable about all sorts. On the contrary, the mind appears to really represent a number of particular abilities, particular acts, particular memories. It appears to be an organ for connecting particular ideas and particular movements with particular situations. The club noticed that these parti-

cular, special abilities might give general ability in so far as they (1) were really accomplishments of general utility, or (2) inculcated *ideas* which might arise in all sorts of situations and influence our behavior, or (3) taught us to deal with certain *elements* which were present in all sorts of different complex situations, or (4) enabled us to deal with closely similar things. Further than this the club wisely decided we should not expect any general influence from anything we learn *unless we see evidence of it.* There is no useful reference for reading about this topic, but it would be an excellent plan to train one's self in some one thing and test one's self before and after training to see if one's general ability in any line had been improved. If one were learning to play the violin, for instance, he could find out whether his fingers were more nimble and accurate in writing on a typewriter after some months' of violin exercises than before. If one were learning to play golf, he could see whether his eye and hand were more skilled in throwing stones or playing croquet after a month's golf practice than before.

CHAPTER XVI

HEREDITY AND ENVIRONMENT

Mr. Tasker opened the meeting of the club by saying: "We are fortunate to-night in having with us Dr. Leighton, whom you all know, and Superintendent Carmody of the county reformatory. Dr. Leighton has kindly consented to tell us about the ways in which the mental make-up of parents influences that of their children. Superintendent Carmody will speak to us about the human nature of criminals. Dr. Leighton, you have the floor."

"Ladies and Gentlemen: What our intellects and characters are you have found to depend on what our nervous organization is. Like it, then, they are determined partly by what is in us from the beginning of life, and partly by what happens to us. Every human being grows from an ovum or egg. This egg contains substances in a certain arrangement, which determine in part what the man or woman who develops from it will be, what bones, nerve-cells, etc., he will have; what things he can do without learning, how much mental vigor he will possess, etc. This egg represents his inheritance from his immediate and remote ancestors. Let us use the word *germ-inheritance* for this.

"Now the egg or germ is affected by all sorts of influences in its months of life before it develops into the new-born baby. It is alive from the start, is

growing, is influenced by heat and cold, lack of food, by poisons which it gets from the mother's blood, and by all sorts of events that happen to it. The growing brain is, of course, as much modified by these influences as is any other part of the body. It is evident that what happens to us *before birth* may make a big difference in our future intelligence and character. If, for instance, our nerve-cells are poisoned by alcohol before birth, we shall suffer just as surely as if we after birth become willful drunkards.

"From birth on, things are constantly happening to us, and we are constantly reacting in various ways. We can all see that what we eat and drink, what we see and hear, whom we imitate, what we do and neglect, all make a difference in our mental make-up.

"What one of us *is* mentally thus depends (1) on his germ-inheritance, what he was at the start; (2) on what happened to his growing brain before birth, and (3) on what happened to it after birth. We doctors use the word 'nutrition' to mean all the influences covered by 2 and 3. It includes the influence of foods and poisons, accidents and shocks, habits and lessons learned, people and things seen, ideals and ambitions inculcated, etc.

Scientists in general reserve the word heredity to refer to only what a human being possesses at the very start. Of course, you could use it as most people do, to mean what tendencies are in a person at birth. If we do, we must be sure to remember that the word then covers real inheritance, and also something quite different—namely, the acquisitions gained before birth. These are tremendously importan

To save any misunderstanding, I will use the phrases *germ-inheritance*, *ante-birth acquisitions*, and *post-birth acquisitions*, or *nurture*, to refer to these three factors at work in developing a human being.

"Let us first ask, 'Which of these three is the most important?' One finds all sorts of opinions about this question. Liebnitz, who was a famous philosopher of the seventeenth century, thought that *nurture* was all important; that if he could control the education of the world's inhabitants he could remodel mundane affairs, and banish ignorance and vice.

"On the other hand, Mr. Francis Galton, the most thorough student of this problem in human nature, says: 'There is no escape from the conclusion that nature [by which he means germ-inheritance plus ante-birth acquisitions] prevails enormously over nurture when the differences in nurture do not exceed what is commonly to be found among persons of the same rank of society and in the same country.'[1]

"If you look at the matter on all sides, I suppose you'd have to say that the germ-inheritance was the most important. That decides whether one will have the mind of a jelly-fish or a dog or a man. It gives a basis without which the other influences could effect nothing. The differences between races, between a negro and an Englishman, between a Filipino and a German, are in great measure due to different germ-inheritances. A man's germinal inheritance is, so to speak, his capital, his stock in trade. He may foster or spoil it by good ante-birth acquisitions; his nurture may increase or waste it. But without it he

[1] "Inquiries into Human Faculty," page 241.

couldn't do business at all, and its nature must decide what sort of business he will do.

"It is probable that general mental ability as well as special mental gifts are in large measure due to germ-inheritance. Mr. Galton has studied this question more thoroughly than any one else, and he decides that in the case of eminent mental gifts he has demonstrated that the son of an eminent man has one thousand times as good a chance of being eminent as the son of the average man. The brother of an eminent man has over five hundred times the chance of being eminent that the brother of the ordinary man has. A grandson of an eminent man has about one hundred and forty times as good a chance; a nephew about one hundred times as good a chance. Training and family influences could not account for this, or even probably for any considerable part of it.

"Eminent mental ability, then, and presumably mental ability in general, is mainly the result of germ-inheritance, not of nurture or education, so far as we can at present see.

"We must remember that he does not mean that the son of a genius will be a genius, or that the son of a clodhopper need not become one of the great ones of the earth. What he means is that there is a very much greater probability for the former event than there is for the latter. We must not expect anything like absolute likeness between father and son, for the son's germ-inheritance is a tremendously complex affair, depending on both sides, subject to all sorts of accidental influences.

"I dare say you've often wondered why the same

father and mother may have children differing so widely in physical and mental make-up. Such cases show clearly the complexity of the matter. Of course, their ante-birth acquisitions may differ, but besides that there are probably differences in the general vigor and developing power of germs from the same parents, but at different times. In pigeons the time of the year makes such differences. Birds which in April hatch strong, healthy offspring may, other conditions remaining just the same, have in September weak, ill-developing young. Finally, let me remind you again that the germ has a great number of possibilities, and the realization of any one of them may be caused or blocked by very slight accidental occurrences. The germ may contain elements which have not openly manifested themselves for several generations, but which still are transmitted from parents to children, and which may at any time appear. A boy may thus develop some mental characteristic exactly like his great-grandfather, though that characteristic hasn't been present in his grandfather or father.

"So much for germ-inheritance of mental characteristics. We now come to the ante-birth acquisitions. The germ depends for its development on the treatment it receives before birth as well as on its inherent nature; especially important is the food supply. Of course, the influence is now indirect, is only through the food supply in the mother's blood, or through physical conditions of heat, cold, shock, etc. How far these influences can make differences in the character and intelligence of the future child, I cannot tell you. They would certainly seem capable of

making differences in his general bodily and nervous, and so mental vigor. Of course, physical diseases thus transmitted may indirectly work tremendous changes in the child's mental make-up.

"It's not my business to discuss the influence on development of what happens to children after birth. But I want to correct a possible misapprehension. When I said that germ-inheritance was perhaps the most important because the most fundamental, I did not mean that the most important special characteristics of human nature were due to germ-inheritance. Truth-telling, diligence, attentiveness, integrity, unselfishness, charity and their like, are all probably characteristics acquired after birth. Speaking broadly, *civilization*, including morality, is in each human being an acquisition, not an inherited trait.

"The great question of all concerning the influence of heredity on the development of human nature is, I think, this: 'Are the habits and powers and interests and ideals we *acquire* in life transmitted to our children? Are the characters we form and the intellectual abilities we attain handed over, in whole or in part, to our offspring? Do we carve out not only our own destiny, but also that of our children?' Our own *inheritance* is passed on, but are our *acquisitions* as well?

"It is certain that in a rough way the sins of the fathers burden their posterity, and on the other hand that the good we do lives after us in the character of our children.

"But you will recognize from what I have already said that many causes may be accountable for this. Intelligent parents may have intelligent children, be-

cause their own acquired intelligence leads them to train them intelligently, because they themselves serve as models for inheritance, because the 'nurture' of their children is such as to develop intelligence. Again, there may be substances in the blood which are acquired by and in turn minister to the healthy, vigorous action and growth of the brain, and the 'ante-birth acquisitions' of children of intelligent parents may thus account for more or less of the mental ability these children show in after life. Finally, there might be real changes in the germs of parents caused by thoughtful, intelligent lives, and thus the acquired intelligence of the parents might make a favorable difference in the germ-inheritance of their children.

"Taking a simple illustration, we may say that a mother who has learned to control fits of melancholy and depression might decrease the tendency to such attacks in her children—first, because her own acquired control over them would cause the surroundings of the child after birth to be favorable; secondly, because she had decreased some substance in her blood which caused them, and so improved the development of the child before birth; thirdly, because she had by her training actually changed the nature of the germs which represent the child's germ-inheritance.

"Now, there can, of course, be no doubt of the first sort of influence. We see evidence of it all around us. And there can be no doubt that so far as there are any substances in the blood that affect mental life, such *might* vary in the child as they varied in the mother. Certain diseases undoubtedly are trans-

mitted in this way. But about this kind of transmission of mental powers I know nothing definite enough to tell you. When we come to the third question, whether mental habits and powers acquired in life so alter the germ substance of the parents that their children will profit by the parents' 'acquisitions,' we find that our present knowledge points to the answer 'no.'

"I can't begin to give you all the arguments pro and con, all the evidence which makes students of the processes of life nowadays decide that a man's germ-inheritance, the make-up of the minute mass of living matter which is his starting-point in life, is independent of the *acquired* nature of his parents. You can see for yourselves that our acquisitions are not wholly transmitted. Ten generations may have acquired the power to read, yet the children of the eleventh have to learn. A child's ancestors for ten generations may have spoken English, yet he doesn't have the power or tendency, and will speak French if brought up by French people. I have said that nowadays we believe that our acquisitions have no direct influence at all on our children's germ-inheritance. The evidence for this belief is like that I've just given for the belief that they are not *wholly* transmissible. It is, namely, that we see no signs of such transmission. For instance, human beings, ever since there were any, have seen the sun, yet a person born blind does not have a mental image of the sun, does not know that the sun exists until he has been taught. Again, people have learned in every generation that fire hurts, have learned to keep their hands out of it; yet chil-

dren tend when they see a bright flame to reach for it. Why, then, should we expect that because a father learns to keep his hands off other people's property, his children should be any less greedy?

"So at present it seems wise to believe that so far as definite particulars go, what a man does in life makes no difference to the germs from which his children will grow. Of course, generally good or poor nutrition of all the parent's body would mean good or poor nutrition of these germs, and that might mean healthy or unhealthy development of mind as well as body in the child. But facts about such general influence are very vague. The practical outcome of this is that a man's becoming a doctor or lawyer or thief or Indian chief need not prove that his son will inherit qualities that will fit him better than his parent for a like career; that having a college education need not make your children inherit any more gifted minds than you did. The gifts that are in our power to bestow on our children are, first of all, proper education after birth; secondly, proper nutrition before birth, and (possibly) thirdly, some of the general physical and mental vigor which we may have acquired."

"I'm sure," said Mr. Tasker, "that we all are obliged to Dr. Leighton for clearing up a matter about which most of us had very vague and mistaken notions. After the meeting is over we can ask questions and make comments about it. I take great pleasure in introducing to you Superintendent Carmody."

"Ladies and Gentlemen: Concerning the mental characteristics of criminals a great deal has been

said, though but little is known. Some students of the matter would tell you that the criminal is a mentally undeveloped being, an immature man, a being whose growth in intellect and character has gone only part way. Others would tell you that the criminal was a distinct species of humanity, clearly marked off from ordinary folks, and that he transmitted his make-up to his children. Others would tell you that there was nothing whatever extraordinary about the general mental make-up of criminals, that the reason for their crimes was vicious and careless training in youth, and that to talk about inherited criminality was as absurd as to talk about inherited knowledge of solid geometry.

"Inasmuch as Dr. Leighton has already given you a statement of the general facts and problems of mental inheritance, I may well begin by discussing the question just hinted at—namely, 'Is the tendency to crimes a matter of germ-inheritance, or is it a post-birth acquisition? Are criminals born or made?' In connection with this question we may run across a number of the noteworthy facts about criminal human nature.

"First of all, let us disabuse our minds of the notion that there is any such thing as *the criminal*, with a perfectly distinct type of make-up. To be a criminal means to behave in a way which the opinion of people in general condemns and stamps as unsatisfactory and menacing to human welfare, and so punishes. Now, a man may behave in such ways in a fit of passion, or under remarkable temptation, or in boyish pranks, though his general character tends entirely to the opposite sort of life. Here we have

a criminal who clearly has *not* a criminal make-up. A good, pious woman is afflicted with a morbid impulse to strangle. She detests the thought and fights against it, but it is overpowering, and she has to give way to it. She kills in this frightful manner her sister's child. But for expert medical testimony she would be punished as a criminal. She has committed a criminal act, though not with criminal intent or from a wicked nature. So with those kleptomaniacs who are really mentally diseased. Again, we have criminals where the cause of the act was a brutal nature, others where it was lack of distinct ideas about right and wrong, others where it was laziness, others where it was a perverted desire to show off before a gang of vicious roughs. A multitude of different mental characteristics may thus lead people to criminal acts and criminal careers. It is therefore evident that if one takes the thousands of criminals, and asks any question about them, the answer which fits some may not fit others. So with our question concerning the inheritance of criminality. The traits which lead a man into crime may in some cases be inherited and in others acquired.

"We can, however, look at the general run of criminals, and in a vague, general way see whether criminal ancestry or vicious training plays the leading rôle. When doing so we should remember that criminal parents are likely to give their children a training such as would probably predispose the best born children to vicious and lawless lives. So when we see crime running in families we must not jump at the conclusion that germ-inheritance is to blame.

"Now, let us take a look at a famous family of criminals. The infamous Juke family of seven hundred and nine individuals, distributed over six generations, produced seventy-seven offenders in one county in forty-five years. If the records from the previous years and from three other counties, and all the records of misdemeanors, could have been added, the number would doubtless be much increased. The history of this family is a disgusting record of debauchery, vice, pauperism and crime.[1] It would seem at the first look that we had here a case of inherited criminality. If we look more closely, we find that the training received by the members of the family, their post-birth acquisitions, may account for their rich harvest of criminals. 'They lived in log or stone houses, similar to slave-hovels, all ages, sexes, relations, and strangers 'bunking' indiscriminately. . . . . Domesticity is impossible. . . . . They . . . . were so despised by the reputable community that their family name *had come to be used generically as a term of reproach.*' The young Juke was thus early familiarized with vice and crime; he was deprived of intercourse with decent children; he had no examples of thrift or industry or honesty or chastity; he was without moral restraint or social discipline.

"That his criminal career was the result of what happened to him after birth rather than of his mental inheritance is suggested by several cases where early marriage and removal from the community was followed by a decent career. For example, a Juke girl

[1]See "The Jukes," R. L. Dugdale.

who had a thoroughly vicious ancestry and had been arrested for vagrancy in her fifteenth year, 'marries a German, a cement-burner, a steady, industrious, plodding man, settles down into a home, ... and takes the position of a reputable woman.'

"That ante-birth acquisitions may have played a part by making the health and physique and mental development of the Juke children such as would unfit them for regular lives and self-control, and make them easy victims of impulse and appetite, is shown by the large percentage of disease and poverty and the general lack of hygiene and personal care. The Juke progeny may have been burdened with a germ-inheritance that would make them likely candidates for criminal careers; they probably were mentally enfeebled by bad nutrition before birth; they certainly were brought up in an environment which would favor the acquisition of immoral and criminal habits.

"We may now turn from this particular family, and look at juvenile offenders in general. One would suppose that if criminals passed on mental characteristics which act as causes to crime, the class of youthful criminals would include a large number of descendants of criminals. Yet only two per cent of the inmates of English industrial schools[1] were found to be descendants of habitual criminals. In fact, the juvenile offender seems to be the product of bad bringing up, rather than of special criminal ancestry. Twenty per cent of the inmates of industrial schools are without a father living, fourteen per cent without

[1]The figures here quoted are taken from W. D. Morrison's "Juvenile Offenders."

a mother living. In the cases of children with both parents living, there is still emphatic evidence that proper restraint and proper moral training are rare. Over three-fourths of the homes from which these children come are, to use Mr. Morrison's words, not 'morally fit for a child to live in.' When children of this very same class are taken and well cared for, they do not become criminals to any greater extent than average children. So we are warranted in the opinion that criminality in this class is in the main not an inborn, but an acquired trait. Their bad training accounts for their offenses, and if good training is supplied, the offenses do not appear. However, though these children do not inherit criminality from their parents, they may, and probably have, inherited more than the ordinary human being's share of mental dullness and incapacity.

"In the study of criminals one thus finds in concrete shape all the problems concerning heredity of which Dr. Leighton told you. How much of the criminal's career is due to germ-inheritance, how much to ante-birth acquisitions, how much to post-birth acquisitions? Answers to these questions are being gradually worked out by students of crime. Do not forget that these factors account for the nature of every man as well as of criminals, and that it will be one of the greatest problems of the future to ascertain in the cases of men of all sorts the exact influence of heredity and of environment. In the case of criminals in general, I personally am inclined to the opinion that no specific tendencies to crime are inherited. Certain general mental conditions may be inherited

which serve as good soil for criminal tendencies to grow in. But the training is the real decisive factor. Other people, however, are of the contrary opinion. We don't know enough yet.

"So much for the question of hereditary criminality. I have a few remarks to make upon some of the mental characteristics of the *average* criminals. Remember, that in many cases these won't fit. First of all, they are, as one would suppose, without moral ideals, feelings of remorse, or much sensibility to any moral emotions. They are below the average in general intellectual powers, though, of course, they may be apt in their particular lines. They are likely to be incapable of sustained effort, and to be irritable and impulsive. They are distinctly religious. 'Out of twenty-eight thousand three hundred and fifty-one admissions to three large metropolitan prisons,' remarks the Rev. J. W. Horsley, only fifty-seven described themselves as atheists, and this number,' he adds,'must be further reduced as containing some Chinese and Mohammedans.' Many of these cases were men who were really rather religious.[1]

"On the whole, the criminal population is not very markedly different from the average. They are not different from other men and women as dogs are different from cats. If I had here a hundred criminals and a hundred average men and women, I am not at all sure that any psychologist could, by a mental examination, pick out the criminals from the rest. Yet as one lives among them and reads widely in the history of crime he gains a feeling of certain types of

[1]For these and similar facts see "The Criminal," by Havelock Ellis.

human nature—the criminal types. I'm not sure, again, that these types are any more distinct than types of plumbers or lawyers or scientists. If you'll come and visit our reformatory some time, you can yourselves judge what the human nature of criminals is like by actual observation. And finally, though I've just done the opposite thing, I advise you to *study* the psychology of criminals rather than *talk about it.*"

CHAPTER XVII

A REVIEW

At this meeting of the club, its members discussed the following questions and observations, taken from their box. They were able, with the aid of the information they had already acquired, to answer the questions satisfactorily, and to refer the observations to similar facts already studied. The editor trusts that his readers can do likewise, and feels confident that they will prefer to think the explanations out for themselves rather than to be told.

"A man who had seen long military service became a waiter in a restaurant. One day a gentleman dining there was telling an anecdote in a rather loud voice, and in the course of it said, 'Company, salute!' The waiter, who was passing by with a tray of dishes, dropped the tray, and brought his hand up to his forehead in the act of saluting."

"A famous French tragedian used to hire a man whom he would beat and pummel as fiercely as possible just before going on the stage to play the last act of Othello. Why did he do it?"

"Samuel Johnston used to insist on touching every lamp-post as he walked along the street."

"Why is it that a person can be extremely accurate in one sort of thing—*e. g.*, keeping accounts—and yet be very inaccurate in other things?"

"I walked down Liberty Street every day for two

weeks, and didn't know that a new house was being built there."

"Some years ago a certain company used to wrap the small packages of tobacco which they sold in papers with pictures of baseball players on them. On these papers it said, 'Save the wrappers.' (A prize was given for every hundred returned.) The small boys of the town would collect these papers, and seeing the inscription, *would save those which had batsmen on them.*"

"There were, I believe, five Poe brothers at Princeton, all of whom played on the Varsity football team. They varied only a few inches in height and a few pounds in weight, and played the same kind of a game. All were of light weight."

"A clergyman started in to preach, and could hardly restrain himself from groaning aloud, so violent was the pain he was enduring from an ulcerated tooth. After a few minutes he felt no pain at all, though it returned when he had finished his sermon."

"What is the basis for this advice, which I read in a book on education: 'To assume the existence of vice [in a child] is often to produce it. We must, therefore, say to the child: "You did not really wish to do that; but see how others would interpret your action if they did not know you."' "

"An Indian visited a camp, and became interested in some of the pictures he saw there. He carefully followed with the point of his knife the outlines of a drawing in a magazine. When asked why he did so, he said that doing so would help him to carve a likeness of it when he returned home. What sort of imagery was strong in his case?"

"E. W. Sabel, in the *Saturday Evening Post*, tells an anecdote of Frederick Villiers, the famous war correspondent. Villiers had been under fire for some days, the enemy bombarding the force to which the artist was attached, so that the arrival of a shell was a commonplace circumstance to be treated in the usual way. Out of this ordeal he came unscathed to London, and was strolling down the crowded Strand.

"On a sudden the pedestrians were appalled to see him fling himself at full length upon the greasy, muddy pavement, and there lie on his face rigid as a dead man. From all directions men rushed to render him assistance. They turned him over to rub his hands and unbutton his collar, expecting to find him in a fit. But no. On his face they found not the pain and pallor of epilepsy, but astonishment and mud. Villiers, when they laid hold of him, quickly jumped to his feet, shook the mud from his hands and clothes, and then looked around for an explanation of his own apparently idiotic act. The explantion was forthcoming.

"A few yards behind him stood a horse and cart. The carter had a moment after Villiers passed pulled the pin and allowed the cart-box to dump upon the ground a load of gravel. The heavy beams of the cart, of course, struck the wood paving with a resounding 'dull thud,' and the clean gravel hissed out with an evil roar. This combination of sounds, the war artist declared, was identical with the striking of a live shell, and Villiers, forgetting that he then stood some thousands of miles from the seat of war, flung himself down to await the dreadful explosion."

CHAPTER XVIII

SOME DEEPER QUESTIONS ABOUT HUMAN NATURE

"I've made a collection of questions from our observation-box which I thought might all be taken up together. I classed them together, not because they were about the same matters, but because I hadn't any notion of their true answers, and didn't see just how they *could* be answered, but perhaps you can do better than I. Here they are:

"No. 1. If our feelings of outside things are due to action in our different senses, so that our knowledge is limited by our sense-powers, so that, in fact, there may be things in the world by which we aren't influenced at all; if, also, there may be differences in things which we don't feel; if, also, we feel as sounds what are really vibrations of the particles of the air, as colors what are really only different rates of vibration of the ether—how can we be said to know the *reality* of the world at all? We don't seem to get it all, or to get all the differences in it, or even to get it as it is. Don't we have just a sham world, and may not the reality of things be entirely different?

"No. 2. What, really, is a 'thing?' Our sensations of things vary. Sugar tastes different after vinegar; it looks different at night; its weight would be different on the moon. What is its reality? What stays the same, no matter how much our feelings of it vary?

"No. 3. If willing means just the fact that some

ideas are attended to, are clear and emphatic and possess the mind, if our actions are the result of the ideas that we harbor, what do we mean by saying that our wills are free? Are they free? Do we really do anything in the universe on our own account; are we really in the game, or does it all run off like a machine? Do we make a difference, or don't we?

"No 4. Is the feeling that we *could* have done otherwise, which we have after an act or a choice, just a delusion? Is the action of our nerve-cells in such cases really decided, as the course of a bullet is, or do our own selves have an influence, play a part?

"No. 5. If our thoughts and feelings go with certain cell commotions in the nervous system, how can we expect to have any existence after our bodies have returned to dust again? Or if we can, what sort of an existence can it be?

"Nos. 1 and 2 are really the same question in different words, you see. So also with 3 and 4.

"I asked Mr. Northrup to come in to-night because a clergyman is supposed to know more about the last three questions than common people. Won't you answer them for us, Mr. Northrup?"

"I won't answer them, because I can't. I could give you on questions 3 and 4 the arguments theologians give, but as there are arguments both ways, and very good and wise people have been on both sides, I suppose that won't help. And question 5 can't, so far as I see, be answered. If you accept the New Testament as a piece of true history, you have evidence for continuance of mental life apart from the body. But our present-day experience

doesn't give evidence such as I understand you've sought in your other studies of human nature.

"I would, however, like to say a word before you begin to talk over these questions. Your study of human nature has led you up to three of life's greatest problems, the problems of knowledge, freedom and immortality. We get a view of the world which enables us to get along in it, but what is it really? Our reasons for believing in the existence of other people's minds are our experiences of their physical actions. What becomes of their minds when their physical actions cease? We make movements, do things in the world, but so do trees and worms. Do we *really* contribute anything to the universe? These are sweeping questions, which have absorbed the thoughts of philosophers for hundreds of years. I don't honestly believe you or I could answer them."

"It won't do us any harm to think about them for a while, I guess," said Arthur. "If they can't be answered satisfactorily, we can pick the most probable answer, or find out how they *might* be answered, or decide which answer, if both are equally likely, it's *best* for us to make, or perhaps find that it's our duty not to make *any* answer, or that it's best, after you've thought things out as well as you can, to drop the whole question."

"I was to blame for that second question," said Mr. Tasker; "and as I've been thinking about it and reading a book my old chum recommended, maybe I'd better say what I can. I've come to think that the reality of things is really an inner life of thought

and feeling something like our own. I'll tell you why. What do you know me as? Your knowledge of me is of a moving thing with brown hair and blue eyes, from whom certain sounds emerge, who is so heavy, and so hard to the touch, who would taste so and so if you were cannibals and ate me. I *to you* am a 'thing' known by sensations. If you didn't see me or hear me or touch me, etc., you wouldn't believe that I existed. But what do I know myself as? I *to myself* am a lot of thoughts and feelings, an inner life of desire, ambition, effort, etc. I am, whether you see or hear me or not. Now, here you have a 'thing' which is known in two ways. To an onlooker, to an outside observer, it is the six-foot biped I described, but it really is a living soul, a personal consciousness. So I say that the rest of the 'thing' world, the trees, stones, worms, etc., are in reality inner consciousnesses. To itself an inner life of feeling is an inner life of feeling. In any one else it only causes sensations of sight, touch, taste, etc."

"Well, I was to blame for the first question, which is substantially the same as the second, and I think your answer is just mystical rubbish," said Arthur. "Certainly a human being does have an inner being, his stream of feelings, and an appearance to other people, his living body. But that doesn't prove that the inner being is the reality, corresponding to the outer appearance. That might correspond to his arm or eyebrow or to nothing, and the rest of the 'thing' his body, or all of it, might have a reality of its own. Moreover, there might be a different law for sticks from that for complex things like the human body.

That a consciousness reality went with one wouldn't prove that it went with another.

"I think we just *don't* know any 'reality' for the world of things, or rather I would say that they have all sorts of realities, because I would say that the ways they impressed us *were* their realities. They are 'all things to all men.' They are what they seem because they really aren't, but only seem. Don't laugh. I mean it. I mean that sugar *really is* sweet one time and not sweet another, white in one light and gray in another, etc., because I claim that all that phrases like *is*, *is really*, *is in reality* can mean, is *feels to us.*"

"I'm sure I don't know what you're talking about," said Mrs. Elkin. "Let's go on to the next question. You men can fight this out later."

"Perhaps I ought to own up to that third question, as to whether we really ourselves initiate any action, whether we really choose between two possible acts, or really are just like clocks wound up by some outside power," said Mr. Elkin. "That is a question in theology that always interested me, and I confess I believe with the old-time Calvinists that an all-wise being could prophesy everything that any one of us will do. I don't see that our actions can be otherwise than the result of our inherited nature and the circumstances which influence us. We are just little wheels in the big universe machine, which turn according to the way the whole machine works."

"Well, I wrote question 4, and I've come to just the opposite opinion" said Mr. Henshaw. "We certainly feel, after any act, that we *could* have done otherwise."

"But there's no guarantee that that feeling represents the true state of the case. The hypnotized person, who is the mere tool of the hypnotizer, sometimes feels that he is doing what he pleases of his own free will. In dreams we feel that things are real, but that doesn't make them so."

"I wasn't going to argue from that. I was just going on to say that if that feeling is a delusion, if we are really just puppets, moved back and forth by some outside power, then responsibility, merit and blame can have no real meaning. If the man who murders his mother does it just because that's a part of the universe-play in which he's a puppet-actor, he can't really be blamed for it. He is acting in just the same way as the hero who saves a life; only he happens to have a different part in the play. If we are to be responsible for our conduct, we must have real control over it. I confess that my experience with people leads me often to doubt whether they are really free agents, directors of their own conduct. In dealing with people we *do* act on the supposition that their choices will be made in accordance with circumstances. We don't expect a man to act freely. We expect his nature and training and the inducements we offer to decide his choice. Still, Elkin, I have faith that this world is a moral world, where people really are responsible for their actions, and so I have faith that their wills are free. Life would be just a sham battle if we didn't count, if we weren't real contributors for good or evil to the world's history. We do make a difference and are responsible

for the differences we make, or else there's no goodness or badness."

"When you put it in that way I don't feel like contradicting you, but how *can* we be real contributors? To say that a man does a thing from free choice seems to me to mean just that he does it by chance, for no reason at all, but we've seen that the ideas he has, the habits he's formed, the motives that are present, decide his action."

"You've got around to where the philosophers are," said Mr. Northrup. "It seems as if our acts were foreordained as a part of the world-machine, but we also all have faith that there is real merit and real blame—*i. e.*, real responsibility—and so we have faith that our acts are not all foreordained, but are really due to our own selves."

"I don't believe Mr. Elkin really believes a word he says," remarked Miss Clark. "People only deny the freedom of the will when they want to excuse themselves from some bad action. It's only people who are bad that claim that we are creatures of circumstance, that drunkenness is a disease, that theft is due to temptation, etc."

"My dear young lady," retorted Mr. Northrup, "I know that the view you've just taken is a common one, but I assure you it's totally false and wicked. One of the best men I ever knew told me that in looking over forty years of his life he didn't see how a bit of it could have been otherwise. He said he couldn't claim praise for any of the good parts, and didn't really see that he could have avoided the bad parts. Any theoretic view may be put to a bad use.

Some folks believe in heaven just because they want to loaf forever. It is no discredit at all to a man if it seems to him that his life is determined for him by the constitution of the universe."

"It seems to me," said Arthur, "that real belief in either of these theories needn't have much to do with saying 'Yea, yea' or 'Nay, nay' to them. Real belief is, I think, a tendency to act as if a thing were so. If we believe that a team is in front of us, we try to get out of the way of it; if we believe that a man is a liar, we don't trust him; if we believe that the moon is inhabited, we'll focus telescopes upon it, and so on and on. Now, just saying a thing is so may be compatible with *real disbelief* of the sort I've described. I should say that the important question was whether a man *acted* as if he were really responsible, acted as if he really could contribute to the good or bad in the world, and that it mattered not so much what he said or wrote about it. Of course, his theories might somewhat influence this more important active belief.

"My interest in this question is not to try to settle it, but to notice that people are split into two great classes, on the basis of their active attitude toward this question. Some people feel responsibility, feel the importance of life, feel that every one of their moral choices will make a difference to them and to the world, and constantly *act* as if they *did* count, as if they were themselves making the world what it is to be. Another class are swayed by outside influences, follow the style, take what comes, accept, as they say, the inevitable. They are always committing their careers into some one else's hands. They act

as if they *couldn't* count, as if they had no part to play, save passive non-resistance. They may say, 'Oh, certainly, I believe in the freedom of the will,' but they are the real disbelievers.

"The same thing holds concerning the last question, the question of the immortality of the mind after the death of the body. There are some people who, whatever they say with their lips, act as if this life was all. They may talk about immortality, but the 'beer and skittles,' the applause and comforts of this mundane sphere, make up the situation to which they react. Other people, some of whom may not be sure that human natures can exist apart from human bodies, yet live as if they were probationers for a larger life, as if in the world as a whole honor and duty and truth and love did count more than they seem to here. Each man chooses the aspects of the universe to which he will react, and these choose to react to the nobler and larger life. The practical question is not, 'What do you *say* the world is?' but, 'What kind of a world is your conduct, your active belief, adapted to?' "

The company were silent for several moments after Arthur had finished. Finally Miss Atwell spoke.

"Yet we ought to know all we can about these things, ought we not? Thomas Arnold says somewhere: 'Concerning whatsoever matters it is our duty to act, concerning those matters it is also our duty to think.' I should suppose that our theoretical opinions would influence what you call our active belief."

"They will, of course. I just wanted to show that the latter was really the more vital fact."

"I asked that question about immortality," Miss Atwell went on. "You don't think it irreverent, Mr. Northrup?"

"Certainly not. It's a question that the most reverent men have again and again asked. Even if we are sure *that* we shall have continued existence, we want to know *how* it is possible."

"I was once taught," said Mr. Tasker, "that my sensations and memories and imagery and feelings of activity and emotions depended on the nervous system, yet my 'reason' did not, and that it would exist after the death of the body, though sensations and emotions, etc., would be gone. That might be true, though I don't believe it is; but I can't see that that sort of immortality would be of any use. You couldn't remember anything, you wouldn't know your own name, or have any facts to reason about, or love, or feel duty. You would just be a bare 'reason,' which would be no better than nothing. Everybody would be alike. Unless we have a real personal existence continuous with this one, I don't see what difference it makes whether we have any."

"I'm glad you spoke of that, Tasker," replied Mr. Henshaw, "because I happened to read a while ago a book by an eminent psychologist, who believes that real complete personal existence *can* continue after death. We often talk as if when one of us died a sort of superfine angelic being was born in the other world. But unless that being is myself, unless it remembers my acts and thoughts, what value is its existence to me, or what justice is there in rewarding or punishing it for my deeds? Now, this psychol-

ogist—who, by the way, believes that our thougnts and feelings do parallel and go with commotions in nerve-cells—says that this need in no way imply that our thoughts and feelings cannot go on just the same or better without them. For, he says, the nerve-cells might be just the means of *transmitting* these thoughts and feelings, which might exist apart, but as light penetrates through transparent substances, so might they appear in connection with these human brains of ours. I think I can quote you one passage from memory.

"'Suppose . . . . that the whole universe of material things—the furniture of earth and choir of heaven—should turn out to be a mere surface veil of phenomena, hiding and keeping back the world of genuine realities. . . . . Admit now that *our brains* are . . . . thin and half-transparent places in the veil. What will happen? Why, as the white radiance comes through the dome with all sorts of staining and distortion imprinted on it by the glass, ... the life of souls as it is in its fullness will break through our several brains into this world. . . . . And when finally a brain stops acting altogether, ... the sphere of being that supplied the consciousness would still be intact; and in that more real world . . . . the consciouness might, in ways unknown to us, continue still.'"[1]

"What do you think of that, Mr. Northrup?"

"That's very ingenious, and of one thing I'm confident. The universe is very big, and may hold facts in store for us that we don't dream of. Among its

[1] William James, "Human Immortality," pp. 16-18.

facts may be a real being for things other than our present feelings of them, a real freedom in our actions, a real existence apart from the body. Of another thing I'm still more confident. The more keenly we seek the truth about how things do *seem* to act, about what they *seem* to be, the better we shall know what they really are. The more earnestly we rationalize our lives, the more fully we rid ourselves of weak superstitions and blind imitation of other people, the less rein we give to accident and mere opinion and gross impulse, the more real freedom of will we shall have, if there be any. And the more zealously we work to make *this* a good and happy world, the better fitted shall we be to take our places in any other."

"I'd like to read you a few words which show a character that realizes Mr. Northrup's ideal," said Mr. Tasker, as he reached over to the bookcase and took down a book.

"The Greek philosopher, Socrates, is on trial for impiety, and is threatened with death. Plato, his biographer, makes him say, in a passage which even in translation is of remarkable beauty:

" 'Some one will say: And are you not ashamed, Socrates, of a course of life which is likely to bring you to an untimely end? To him I may fairly answer: There you are mistaken; a man who is good for anything ought not to calculate the chance of living or dying; he ought only to consider whether in doing anything he is doing right or wrong—acting the part of a good man or a bad. . . . . For wherever a man's place is, whether the place which he has chosen or that in which he has been placed by a com-

mander, there he ought to remain in the hour of danger; he should not think of death or of anything but disgrace. And this, O men of Athens, is a true saying.

" 'Strange indeed would be my conduct, O men of Athens, if I who, when I was ordered by the generals whom you chose to command me at Potidæa and Amphipolis and Delium, remained where they placed me, like any other man, facing death; if, I say, now, when, as I conceive and imagine, God orders me to fulfill the philosopher's mission of searching into myself and other men, I were to desert my post through fear of death, or any other fear; that would indeed be strange, and I might justly be arraigned in court for denying the existence of the gods if I disobeyed the oracle because I was afraid of death; then I should be fancying that I was wise when I was not wise. For the fear of death is indeed the pretense of wisdom and not real wisdom, being a pretended knowledge of the unknown; and no one knows whether death, which men in their fear apprehend to be the greatest evil, may not be the greatest good. Is there not here conceit of knowledge which is a disgraceful sort of ignorance? And this is the point in which, as I think, I differ from others, ... that whereas I know but little of the world below, I do not suppose that I know, but I do know that injustice and disobedience to a better, whether God or man, is evil and dishonorable.' [1]

"Socrates is declared guilty and condemned to death. His last words to the judges are:

[1] Jowett's translation of Plato's 'Apologia."

" 'Still I have a favor to ask of them. When my sons are grown up, I would ask you, O my friends, to punish them; and I would have you trouble them as I have troubled you, if they seem to care about riches or anything more than about virtue, or if they pretend to be something when they are really nothing—then reprove them as I have reproved you, for not caring about that for which they ought to care, and thinking that they are something when they are really nothing. And if you do this, I and my sons will have received justice at your hands.

" 'The hour of departure has arrived, and we go our ways—I to die and you to live. Which is better, God only knows.' "[1]

[1] Idem.

CHAPTER XIX

SOME ADVICE FROM THE EDITOR ABOUT MEANS OF STUDYING HUMAN NATURE

There are many aspects of human nature which we may study, and a number of ways of knowing about them. One may, for instance, by living among people and watching their ways, gain an undefined, intuitive skill in guessing what is in a man's mind, how he will act in various circumstances, and what are the best ways to handle him in order to attain some purpose we have set before us. The book agent knows human nature in its book-buying features in this way. The experienced teacher may in this way have a practical knowledge of children, though she might not know how many senses they had or what the difference was between memory and instinct. The tactful society woman, too, may have a successful insight into people's feelings, without being at all able to analyze or describe them. A lofty instance of this intuitive knowledge of human nature due to the concrete study of actual people was furnished by Abraham Lincoln.

There are also some gifted minds who, even in imaginative flights and conventional literary productions, are able to present living men who might walk out of the novel or play into our church or club. To take the stock example, Shakspere possessed an

imagination that could manufacture a dialogue that rings true to human nature. Yet he probably knew less than Mr. Tasker about the definite questions discussed in this book. He knew human nature imaginatively, but not scientifically.

Now, it is patent that the editor of this book has no such knowledge of human nature as enables one to give lifelike portrayals of men and women. On the contrary, the characters in this book are little better than marionettes. They all talk alike. If you take a sentence and try to guess which member of the club spoke it, you find that you can't, that the author hasn't endowed his characters with life. If the book were intended to display the human nature of Mrs. Ralston and Misses Atwell, Fairbanks and Clark, and the rest, it would be a complete failure. Dramatically it is an atrocity. Further, it is extremely probable that the author would make a mediocre book agent, and bring calamity to any social circle he might try to lead.

One can study human nature considerably, then, without gaining concrete insight into people's minds or ability to portray them. One can study the *elements* that make up a person's mind and the *general factors* that influence our mental lives. This is what the psychologist does, what the members of the club did. It is likely that such general study of the workings of human minds will assist one's practical insight into concrete, individual characters. But the one does not presuppose the other.

This study of the general factors at work in all minds consists of observing facts, thinking about

them and testing the opinions thus gained by seeing how well they fit the facts observed. It is especially desirable to devise circumstances in which a person's behavior will reveal important facts about the workings of his mind, and reveal them in a definite, exact and unmistakable way. If you wish to know whether a person has acute power of sensation—of sight, for instance—it is better to arrange a lot of letters as oculists do, and observe how well he can read them at a certain distance, than to trust to your general observations of the way he uses his eyes. It is better to make exact observations under illuminating conditions—that is, to make experiments—than to trust to chance observations. One can almost always improve his vague opinion on any subject by devising means to make his observations more detailed, more accurate and more significant.

In studying human nature in the psychologist's way, one may well begin by observing and experimenting on one's self. Look at your sensations, imagery, memories, judgments, emotions, decisions, acts, habits; test the delicacy of your discrimination, the extent of your memory, the degree of concentration of which you are able; recall and think out your trains of thought, your dreams, your tastes and preferences. The result will be that you will be better able to understand other people and to appreciate the meaning of what is said in books about psychology. The chapters in James's "Principles of Psychology" mentioned at the end of this book will be a helpful guide in this work.

Mental life is, however, broader than the measure

of any single person's mind, and though training in the description and analysis of one's feelings is a useful, perhaps necessary, preliminary to the study of human nature, it is only one of a number of studies worth undertaking. Those whom it specially interests may carry it out to a well-nigh unlimited extent, picking to pieces every feeling they have, and discovering its exact nature and composition, but the average student will prefer to leave it after a while in favor of some of the following topics:

1. The causes of our intellects and characters, the nervous activities which go with them, the influence of inherited structure, general bodily condition, drugs, foods, climate, brain diseases, education, etc.

2. The causes of special mental and moral qualities, such as genius, insanity, criminality, idiocy, superstition, 'crankiness,' sentimentality, accuracy, attentiveness, etc.

3. The origin of human nature and its development in the life of each human being from infancy. The mental life of lower animals.

4. Differences in the mental make-up of different races and nationalities of men.

5. The influence of our mental constitutions, our thoughts and feelings, on our actions, and so on other people. The part mental life plays in the world.

6. The exact estimation of any individual's mental equipment and tendencies. A mental diagnosis which may inform a man what his nature is, how he differs from his fellows, what he is good for, what his weaknesses are, etc.

Other topics—*e. g.*, the psychology of men as

social beings, considering the relations of one mind to others, might be added to this list, but it is already long enough to show that there are plenty of questions concerning human nature worth thinking about.

You may remember that the founders of the club started out with the notion that they could observe human nature without book knowledge or previous experience. They found it worth while to call in a man who knew about the human brain at their very first meeting, and they soon turned to Mr. Tasker's books as helpful and even indispensable. As soon as you study any aspect of human nature in earnest you will find that progress depends on knowing what other people have found out in that, and indeed in other sciences. To know much about a man's mind, you must know about his body, especially his nervous system, and thus you need a knowledge of anatomy and physiology. To study our second topic to the best advantage you must know something of the general laws of heredity. To study the third topic you must know the order of development in the animal world. Thus one needs an acquaintance with zoölogy. So on through the list.

One's first duty, then, is modesty. Every reader of this book should know that it gives but a bare and meager outline of a very few of the facts of human nature, that it can only be an introduction to the study of mental life. Knowledge of psychology and ability to study psychology fruitfully are, we shall all agree, worthy accomplishments. Like most good things. they are hard to get. The best fruit on the

tree of knowledge is on the topmost branches. To reach it you must climb.

I have placed at the end of this chapter a list of books which may serve as guides in the study of psychology to any who have been awakened to an interest in such facts as this little book describes.[1]

In reading them it will be well to make as you go along a list of words the meaning of which is not entirely clear, and so far as possible to find out in each case the exact meaning then and there. It will also pay to compare the opinions of different authors in cases where they treat the same topic. It is of the utmost value to think up examples of every fact you learn, to note any evidence you can from your own experience for or against any statement made by an author, and to make sure as you go along that you know just what question the author is trying to settle, just what he is driving at. Finally, it is our duty toward any writer to drop for the time being our previous conceptions and prejudices, to receive his opinion in an open mind.

Reading books is but one way to get knowledge, and possibly not the best. If you have followed the suggestion made in the introduction, and collected facts and noted questions and made experiments, you will recognize that we verify our book knowledge by associating with it knowledge of real things. In the end, psychology must always be a system of facts about real men and women, and the study of books about psychology will be of most value to him who

[1]These books are all worthy of purchase by any public library. Their contents should be in the main intelligible to any thoughtful student of this book.

studies real people as well. General observation of people's thoughts and conduct should have already become your habit. Special detailed study of some phase of mental life is also of great service in bringing us close to fact and teaching us care and precision.

I have therefore prepared directions for a number of such studies, none very pretentious, but all worth undertaking if one has the serious purpose of improving his knowledge of psychology. Unless you are considerable of a genius it will be wise to follow these directions exactly.

1. *A Psychological Autobiography.*

The aim of this study is to find out what factors determine your mental history, what makes you the man or woman you are.

Record every year what you think your mental make-up is, what knowledge, interests, habits, powers, ideas, emotional tendencies and type of will you possess. Write in detail. After the first record, made say in January, 1901, you need record annually only *changes—i. e.*, additions or losses. Then record all the important factors under the influence of which you have been that year. Then try to think how each change in you has been caused, and what the effect on you of each influence has been, and write down your opinions. So far as possible, recall your make-up at each year of your life, as far back as you can remember, and make a record for each year. Do the same with the influence of each year. Try to think out what has made you what you are from childhood on. Get the opinions of your family and friends.

Try to find good evidence for every opinion you form.

A record like this is less irksome to keep than a diary, and probably much more profitable. A handy way of keeping it would be to use very wide paper, dividing it by vertical lines into three columns. In the first, one should describe his make-up under a number of separate headings, such as—

age
height
weight
health
eyesight
hearing
imagery
memory
attentiveness
method of thinking
suggestibility
imitativeness
likes
dislikes
emotions
    vigor
    kinds
        ———
        ———
        ——— etc.
    sentimentality
    nervousness
bodily control
type of will

In the second column should be described, in some regular system of groups, all the factors that have been influencing you, such as:

1. Variations in growth, health, or other physical influences.

2. Physical surroundings—*i. e.*, locality, sights, sounds, etc.

3. Persons. In the home.
Out of the home.

4. Organizations—*e. g.*, Church.
Club.
Business life.
Political life.

5. Information acquired—*i. e.*, the influence of books, studies, etc.

In the third column should be noted the inferences about what factors in column 2 caused the changes noted in column 1. Of course, such a record should be carefully preserved, as it might be of great interest to one's children.

A final caution is necessary concerning such a record. Confine yourself strictly to matters of *observed facts* concerning the *outward manifestations* of your make-up. Do not for the purposes of this record, or indeed for any purpose, think about your inner self, your peculiar inward being or your moral nature. Do not pry into what lady novelists call "the recesses of your heart." Your opinions about them would be of no psychological value to you or any one else, and they do not work well if looked at too often.

A Study of Habit.

In general.

The aim of this study will be to give you some concrete ideas of (1) the part habits play in human

nature; (2) the regularity of habits; (3) their variety among different people; and (4) the speed with which acts become habitual.

Notice in yourself and in as many other people as you can what acts are performed by mere force of habit. Keep records. See how much of human life is carried on in this way. See in the case of certain common automatic actions (1) whether the same person regularly performs the act in the same way; (2) how far different people perform the act in the same way. Keep records. Notice the growth of some habit.

In particular.

1. Think of a number of acts in the case of which it seems to you worth while to ask, "Is this performed automatically, or does it require conscious direction?" Take a broad sheet of paper and arrange your list in a column at the left-hand edge. Then at intervals of an inch or two rule vertical lines down the page. At the head of the columns thus formed put the names of the people you are observing, and a brief description of them—*e. g.*, age, occupation, early training, etc. Then when you find out whether any act is in the case of any one of them automatic, make a note beneath the proper name and on a level with the proper act.

Your sheet then will look like the table given on page 224, after some time's work, and should eventually be entirely filled out.

2. Make a list of common habitual performances—*e. g.*, putting on one's shoes, taking them off, taking off one's collar, opening the door of some frequently

	MRS. A. 43 yrs. old, etc.	MRS. B. 28 yrs. old, etc.	C. K. 5 yrs. old, etc.	D. E. 11 yrs. old, etc.	ETC.
Eating bread	Yes, with exceptions.	Yes, with exceptions.	Partly.	Yes.	
Dressing	No.	Yes.	No.	Partly.	
Knitting	Yes.		No.		
Adding				No.	
Sailing a boat		Yes.			
Repeating rituals, etc.—*e.g.*, a judge's administering of the oath, saying the responses in a church service		Yes.		Yes.	
Etc.					

visited room, carrying a light bundle, order of acts on sitting down to the breakfast-table, etc.

Notice in every person you can whether the act is always carried out alike on say four different occasions. For instance, notice whether you always put on the left shoe first. Do you always take the same shoe off first? Notice which end of your collar you button first. See if you always do so. Observe in the same way which hand is used to open the door, to carry a light bundle. It is still better to make the same observations concerning other people. And with such acts as the last example given above, it will probably be advisable not to try to watch yourself, as the idea of the watching will make your actions unnatural. Such acts as this last example are complex, and so your notes will have to be something like this:

Mrs. A—
Monday, took napkin, put it on lap, looked at clock, drank water.
Tuesday, took napkin, put it on lap, drank water.
Friday, took napkin, put it on lap, looked at clock, moved her knife and fork.
Monday, took napkin, put it on lap, moved her knife and fork, drank water.

Of course, you may find no such regularity.

When you have gained an opinion concerning the regularity of habits in individuals, you can compare them with each other—*e. g.*, suppose you have observed ten persons who regularly take off the same shoe first. Count up the number among them (1) who take off the right shoe first, and (2) who take off

the left first. You can also see whether a person who is regular in one habit tends to be regular in all sorts of things, and vice versa.

3. Take some simple accomplishment and practice it until it becomes automatic—*e. g.*, writing a certain sentence on a typewriter, playing a piece of music, adding columns of figures. Keep records showing your improvement by the *decrease* in the time taken as the thing becomes habitual, decrease in mistakes, decrease in effort, decrease in disturbance by conversation, etc., increase in ability to yourself do something else at the same time—*e. g.*, talk, read, think, do mental arithmetic.

Suppose, for example, you each day do ten examples in addition of this length·

```
 94935
 88789
 67598
 88986
 45678
 98746
 94937
 89789
 68598
 56786
 88986
-------
```

After a while you will be able to add and talk at the same time. You will also increase in speed, and find it after a while no effort. In carrying on such an experiment, you should make out on cards about fifty such examples. When you add, lay the card on a piece of paper, and put your result beneath it, thus:

32657
89456
23472
98657
79864
43729
94976
98678
89567
89976
78868
97869
917769

You can then use that same card again and again on later days, and save the work of making out new examples. You will need fifty or more cards, however, so as not to have the same example reappear often enough to be remembered.

On each day, or every second or third day, record (1) the time it takes you to do four examples; (2) the number of mistakes made in these four, if any; (3) your ability to work while some one is talking to you, and (4) your ability to work and talk at the same time. Two examples may be done under each of these conditions.[1] See how far these records show the formation of the habit.

[1]The record may be kept in this way:

	Time taken to do four.	Mistakes in four.	Time for two when disturbed.	Time for two while repeating poetry.
Jan. 4.....				
Jan. 5.....				
Jan. 6.....				
Etc.				

You can write the correct answer on the back of each card, or you can number the cards and make out a key with the right answer for each number. There will be hardly any labor in comparing the answer you obtain with that on the card or in the key and noticing how many figures, if any, are wrong.

A Study of Pleasure.

Get as many people as you can to write down or tell you the ten things which they enjoy most, in which they feel the most pleasure at the time. After this, get them to number according to the degree of pleasure they gain from them the following:[1]

Eating dinner.
Playing your favorite athletic game.
Playing your favorite sedentary game.
Working with tools, as in a garden.
Reading a novel.
Hearing music.
Talking to a friend.
Day-dreaming.
Learning something.
Writing something.

Look over your lists. Consider whether various scruples—conventional, moral, etc.—would prevent people from mentioning certain things which might really give them the utmost pleasure. Consider how far any one is himself incapable of judging what he likes best. With these precautions, notice what pleasures people in general esteem, how far individuals differ, how far men and women differ, children and adults. Recall the pleasures of people of other nationalities. How much of people's tastes in the

[1]Copied from the "Psychological Tests" used at Columbia University.

matter of enjoyment seems inherited, how much due to training.

Collecting Data for the Study of Heredity.

The aim of this piece of work is to obtain a careful record of some simple facts about the physical and mental make-up of the different members of the same family.

Get printed a hundred or more sheets like the following:

1. Date of birth---------- Birthplace----------
2. Occupation ---------- Residences ----------
3. Age at marriage----------
4. Age, at marriage, of wife----------
5. Mode of life so far as affecting growth or health ----------
6. Was early life laborious? Why and how?----------
7. Adult height---Color of hair when adult---Color of eyes--
8. General appearance----------
9. Bodily strength and energy, if much above or below the average----------
10. Keenness or imperfection of sight or other senses----------
11. Mental powers and energy, if much above or below the average----------
12. Character and temperament ----------
13. Favorite pursuits and interests-----Artistic aptitudes ----
14. Minor ailments to which there was special liability } In youth ---------- In middle age ----------
15. Graver illnesses { In youth---------- In middle age----------
16. Cause and date of death, and age at death----------
17. General remarks----------

NOTE.—This table is taken from the 'Family Records' of Mr. Francis Galton.

Have your immediate and remote relatives fill them out carefully and completely. At the head of each

put the name and relationship of the person *fully*. Do not say grandfather, but father's father, or mother's father, according to the side of the family on which he is. So with all relatives. You might thus have for a very distant relative:

Mother's father's mother's brother's son.

Keep all these records together. You will find them interesting to show relatives, and to examine yourself for cases of inherited mental qualities, and for the influence of training as well.

If these studies lead you to invent others, to think about human life for yourself, and to try to see into it, you may be sure that they are worth your while.

REFERENCES FOR THE FURTHER STUDY OF PSYCHOLOGY.

The best book to begin with is William James's *Talks to Teachers on Psychology*, etc. Henry Holt & Co., New York Pp. 301. Price, $1.50.

The next best book is by the same author; *Principles of Psychology*. 2 vols. Henry Holt & Co., New York. Pp. 1193. Price, $4.80. Read first chapters IV, IX, X, XI, XII, XIII, XIV, XVI, XVII, XVIII, XIX, XXI, XXII, XXIII, XXIV, XXV, XXVI.

If this much reading has been done, any of the following list of books may be profitably begun:

E. B. Titchener, *Outline of Psychology*. The Macmillan Co., New York. Price, $1.50.

F. Galton, *Inquiries into Human Faculty*. The Macmillan Co., New York. (Out of print at present.) Pp. 379.

C. Lloyd Morgan, *Introduction to Comparative Psychology*. Scribner's, New York. Pp. 377. Price, $1.25. (Discount generally obtainable.)

G. F. Stout, *Manual of Psychology*. Hinds & Noble, New York. Price, $1.60.

F. Warner, *The Study of Children.* The Macmillan Co., New York. Pp. 250. Price, $1.00.

N. Oppenheim, *The Development of the Child.* The Macmillan Co., New York. Pp. 292. Price, $1.25.

In connection with the study of the human mind it is of great value to know something about the human body. For this purpose, read:

The Human Body, H. N. Martin. Elementary Course, pp. 261; Briefer Course, pp. 377. Henry Holt & Co., New York.

Primer of Physiology, T. H. Huxley, revised by F. S. Lee.

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